



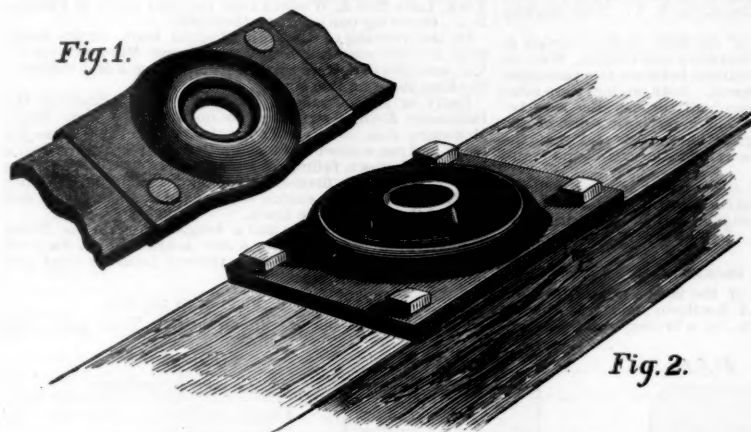
FRIDAY, AUGUST 23, 1878.

**Steel Centre-Plates.**

The substitution of steel for iron in the construction of cars seems to be going on steadily, and in many cases the introduction of steel is almost unnoticed. Herewith we give illustrations of steel centre-plates for cars made by Messrs. Wilson, Walker & Co., of Pittsburgh, for the Chicago & Alton Railroad, to take the place of the cast-iron plates represented by figs. 6, 7 and 8. Fig. 1 is a perspective view of the top steel plate inverted, fig. 2 of the bottom plate. Figs. 3, 4 and 5 are longitudinal and transverse sections and plan of the steel plates, which are made of  $\frac{3}{8}$ -in. boiler plate, forged into the proper shape between special dies made for the purpose. The weights of these plates are as follows:

	Steel.	Cast Iron.
Top plate.....	8 $\frac{1}{2}$ lbs.	56 lbs.
Bottom plate.....	15 "	38 "
Total.....	23 $\frac{1}{2}$ lbs.	92 lbs.

The difference in weight of one pair of plates is therefore



68 $\frac{1}{2}$  lbs., making a total saving per car of 137 lbs. We are not able to give their relative cost, but the saving in dead weight by their use is obvious.

**Contributions.****Water-Tubes in Locomotives.**

TO THE EDITOR OF THE RAILROAD GAZETTE:

You once intimated that something could probably be said in reference to the use of water-tubes in locomotive boilers, and though it may not have been your thought at the moment, it is certain that two things may be said of them without fear of successful contradiction. One is that a great variety of water-tube devices have been tried from time to time in locomotives, and the other is that very nearly all of them have completely failed, sooner or later. This state of things might seem at first thought conclusive against the water-tube for the locomotive in any form whatever, but a careful examination of the conditions of the case may be interesting and useful, and it may also aid in suggesting, after all, some means of rendering available for the locomotive the high evaporative power of the water-tube, which, when the tube has been correctly placed, is universally recognized.

A very useful and marked series of "points" has been noted by Mr. Robert Wilson (*Engineering*, Jan. 11, 1878), relating to the conditions which must be maintained in order that the use of water-tubes, in boilers of any kind, may be completely successful. These "points" are as follows:

1. To keep the joints out of the fire.
2. To protect the furnace tubes from the sudden impingement of cold air upon them on opening the fire-door.
3. To provide against the delivery of the cold feed direct into the furnace tubes.
4. To provide means for a proper draft (that is, sweeping circulation in order to carry away the steam from the heating surfaces).
5. To provide passages of ample size for the upward currents of steam and water, which must not interfere with the downward currents of water.
6. To provide passages of ample size for the steam and water between the various sections of the boiler, in order to equalize the pressure and water level in all.
7. To provide ample surface for the steam to leave the water quietly.
8. To provide a sufficiently large reservoir for the steam, in order to prevent the water being drawn out of its proper place, by suddenly opening a steam or safety valve.
9. To provide against the flame taking a short cut to the chimney, and impinging against the tubes containing steam only.

Let me say here, in passing, that I have no specific plan of water-tubes to urge, but, on the contrary, I think it may be

doubtful whether they can be usefully employed at all, so long as the present general outline of the locomotive boiler must be preserved. I have had occasion, however, to observe the long-continued and well-approved use of water-tubes in stationary boilers, and hence am the more disposed to consider the problem as not wholly impracticable for the locomotive.

These "points" were noted by Mr. Wilson in connection with the use of water-tubes in marine boilers, and hence, as will readily be seen, part of them refer to the conditions of marine service only, and would affect locomotive practice but very slightly under any conceivable circumstances.

For the present, and probably for some years to come, it is quite certain that no change in the general outline of the boiler, as a whole, can be expected by those who wish to introduce water-tubes. It is equally certain that no material increase in the flat stayed surfaces can be permitted, for with the high pressures now carried, and that are likely to be increased, these surfaces are already a heavy and costly fraction of the whole. It is also certain that no fire-brick, or similar material for an inclosing chamber for the water-tubes, will ever be tolerated on a locomotive, for the chief reason for urging at all the use of water-tubes is the need of a reduction in the dead weight now carried in the boiler.

In general terms the true idea of the water-tube is the maintaining of strong and clearly defined currents of water

signed chiefly to meet the case of marine boilers with tubes made of riveted plates, of thicker iron than would ever be used in solid tubes in locomotives. It is interesting also to note how many questions as to dimensions, method of setting, of repairs, and of general expediency arise at once in such a discussion, quite independently of the mere question of the usefulness of the water-tube. No doubt many of the innumerable devices that have been abandoned in past years have failed simply because they were not the right thing for the locomotive, however admirable they may possibly have been somewhere else.

P. BARNES.

**The Worcester & Shrewsbury Railroad.**

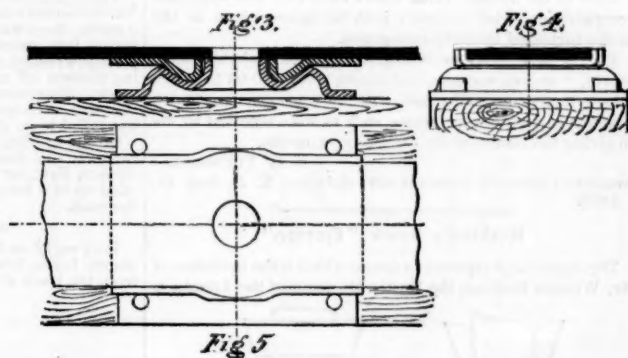
WORCESTER, Mass., Aug. 17, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your paper of Aug. 9, there appeared a communication signed "J. D., Boston," in which he says that the superstructure of this road cost \$493 per mile, and immediately asks, parenthetically, "What kind of a superstructure can be laid for that amount?"

Farther on, the writer says, in reference to his figures: "These figures are all practical; they are the results of facts with no 'suppose' about them, and if not absolutely accurate, are at least a very close approximation," etc.

The Worcester & Shrewsbury Railroad was built in 1873, and was the first narrow-gauge road in New England. The

**STEEL CENTRE-PLATES FOR CARS.**

in and throughout the heated atmosphere of the fire-box itself, and it is probably safe to say that if this be done perfectly, the highest possible efficiency of the heating surface will be secured. The simplest way to bring any large area of surface in water-tubes within the present outline of the boiler is, without doubt, to lengthen the fire-box when practicable, thus shortening the ordinary fire-tubes. If the water-tubes are then set in the lower part of the front tube-sheet, reaching up to the back end of the fire-box above the fire-door, they will lie in about the same position as the common water-grate bars, except that they will be two

cost of superstructure (iron costing then \$90 per ton) was \$6,061 per mile, and our whole cost \$11,483.80 per mile. (Massachusetts Railroad Commissioners' Report for 1874, page 449.)

Whatever of truth there may be in "J. D."s statement concerning the other narrow-gauge roads of this Commonwealth, I am unable personally to state; but should all his figures and conclusions bear the same "close approximation" to facts as the above statement concerning this company, the following proportion would result, viz.: \$483 : \$6,061 :: 1 (truth); 12.29 (errors).

If "J. D." were one-half as anxious to ascertain facts in relation to railroads as he apparently is to sneer at the narrow-gauge system, or had he possessed the same familiarity with the preceding reports of the Massachusetts Commissioners that he evidently wishes people to believe he has with the Report of 1876, he would not have allowed himself to be so absurdly deceived by a clerical error.

In the same article (Table "A") the writer states the cost of transporting a passenger upon this road at 24 cents. Now, the average rate of fares upon our road (it being a short suburban line) is only about one-third of that sum, and we should be pleased if "J. D." would have the kindness to inform your readers how the company has been enabled to pay its expenses and have something left over each year of its existence, if it has actually cost for transporting passengers three times what it receives.

How conclusive are such arguments, or rather statements, when supported by such facts?

The day for sneering down accomplished facts is past. The Worcester & Shrewsbury Railroad now runs 30 passenger trains daily throughout the year. It has safely carried about 10,000 passengers in a single day; is able to take care of its own affairs and pay its bills, and its managers, after five years' experience, would not alter its gauge to-day could it be done without cost.

D. M. WHEELER.

**Patent Depot Platforms.**

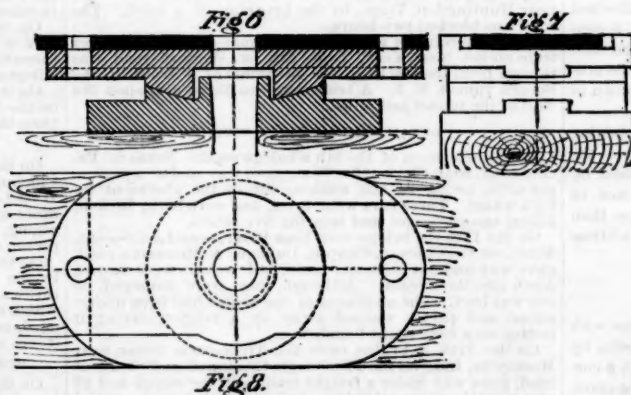
TO THE EDITOR OF THE RAILROAD GAZETTE:

Railway companies are being notified that L. J. Swett, Architect and Superintendent of Buildings for the Central Vermont Railroad, has taken out "Letters patent No. 201,571, dated March 19, 1878, for Improvements in Depot Platforms."

I am informed that precisely similar platforms, for combined freight and passenger stations, were built upon the Illinois Central Railroad, L. H. Clarke, Chief Engineer, as follows: At Heyworth and Tonica in 1871; at Danforth, Radom, Sigel and Thomasboro, in 1873; at Rantoul, Sulphur Springs and Tucker, in 1875. Since Mr. Clarke left the road two more were built at Oyens and Vena, in 1877.

I. OPENER.

CHICAGO, Aug. 5, 1878.





## Graphic Solution of Train Problem.

BRUNSWICK, Me., Aug. 19, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

If Mr. Shanahan is, as he says, unable to comprehend the graphic solution of the "Train Problem" which I sent you, I am afraid I cannot help him, unless by referring him to the small book, No. 16, of Van Nostrand's Science Series, in which the matter is treated in the most elementary manner. I think he will find that it makes little difference how complex the problem is, when the method I have suggested is used. A good test of the relative simplicity of methods is found in problems where trains run in opposite directions, and upon endless tracks, like the one around the Centennial grounds in Philadelphia. As to demonstrating the correctness of the mode I employed, it never occurred to me that a thing so simple needed any demonstration. Indeed, the mode I have used is nothing but an application of the well-known process of making time tables, which has been in use certainly since 1855.

GEORGE L. VOSE.

## Co-efficients of Friction.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the table of co-efficients of friction reported by me and printed on page 384 of the *Gazette* of Aug. 2, the line "Co-efficients of Friction, per cent." should read "CO-EFFICIENTS OF FRICTION;" i. e., the minimum value for sperm oil on steel journals in bronze bearings is one-quarter of one per cent.

This is the lowest value that I have ever met with, and compares somewhat curiously with the figures given in the tables furnished by early authorities.

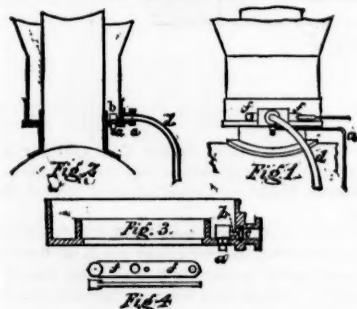
For instance, Rankine, who gives, quoting probably from Morin, "smooth surfaces, best results" ( $\mu$ ),  $f = 0.03$  to  $0.036$ , which figures are only met with on journals in ordinary practice at very low pressures, such as were reported by me in giving the results of my earlier experiments.

R. H. THURSTON.

STEVENS INSTITUTE TECHNOLOGY, Hoboken, N. J., Aug. 15, 1878.

## Rushton's Spark "Ejector."

The engravings represent a device which is the invention of Mr. William Rushton, the Master Mechanic of the Atlanta &



West Point Railroad. Fig. 1 is a side elevation of the base of the chimney of a locomotive; fig. 2 a transverse section of the same and fig. 3 an enlarged view of the base. The ejector consists of a steam jet which is introduced through a pipe, *a*, the steam escaping through a nozzle, *b*, which is directed outward through the opening *c*, to which a pipe, *d*, is connected by which the sparks are conducted downward and delivered near the track. The opening *c* in front of the nozzle is closed by a suitable slide-valve, *f, f*, which is shown in an enlarged scale in fig. 4.

The operation of the apparatus consists simply in opening the slide-valve and turning on steam, which blows the sparks out of the discharge pipe, *d*. It has been used on wood-burning engines only. It is feared it would not be very efficient where coal is burned, as the cinders are then liable to cake into a more or less solid mass. The address of the inventor is Mr. Wm. Rushton, Atlanta, Ga.

## "Cambria" Rail Splice.

This device is intended to furnish railroad companies with the means of effectually locking the nuts of splice-bolts, by the use of simple and cheap keys. A slight rib with a corresponding groove, *A*, fig. 1, is rolled in the splice-plate, which prevents the key from slipping out sideways. The rib also prevents the bolt-head from turning, as shown in fig. 3, and thus it permits the use of round or oblong holes in the bars. The key for holding the nut from turning is driven into the groove as shown at *A* in figs. 1 and 2, and is then bent up and around the nut as represented in fig. 2, so that the key cannot slip out endwise, and at the same time it prevents the nut from turning.

This splice is manufactured by the Cambria Iron Company, whose address is either Johnstown, Pa., or with J. S. Kennedy & Co., selling agents, No. 41 Cedar street, New York.

## Train Accidents in July.

The following accidents are included in our record for the month of July:

## REAR COLLISIONS.

On the morning of the 4th a passenger train on the Pittsburgh, Ft. Wayne & Chicago road ran over a misplaced switch and into the rear of a ballast train, which was standing on a siding at Rochester, Pa. Several cars were badly damaged.

On the 4th, on the Wabash road, in Peru, Ind., a wiper tried to back an engine standing on the track, but could not stop it after it had started and it ran down the track and into a coal train, wrecking several cars.

About noon on the 17th a coal train on the New York,

Lake Erie & Western road ran into a preceding train near Craigville, N. Y., breaking 18 coal cars badly. The engine was thrown down a bank, injuring the engineer badly and two others slightly.

On the evening of the 18th a freight train on the Cleveland, Columbus, Cincinnati & Indianapolis road ran into the rear of a passenger train, which had stopped near Miamisburg, O., on account of a tree blown down across the track. The rear passenger car was wrecked and two passengers hurt.

On the 21st a passenger train on the Long Island Railroad ran into the rear of a preceding passenger train, the engine of which had broken down near Far Rockaway, N. Y., doing some little damage.

Early on the morning of the 29th a freight train on the Baltimore & Ohio road ran into a preceding freight train near Smithton, Md., wrecking several cars and blocking the road two hours.

## BUTTING COLLISIONS.

On the night of the 9th there was a butting collision between a freight train and a yard engine on the New York, Lake Erie & Western road, in Middletown, N. Y., by which both engines were slightly damaged.

On the evening of the 12th, on the Philadelphia & Reading road, near Tremont, Pa., there was a butting collision between a passenger train and the light dummy engine used by the Superintendent. Both engines were damaged and two men slightly hurt.

On the 25th there was a butting collision between a Boston & Albany and a Harlem Extension freight train at Chatham Four Corners, N. Y., by which both engines were badly damaged.

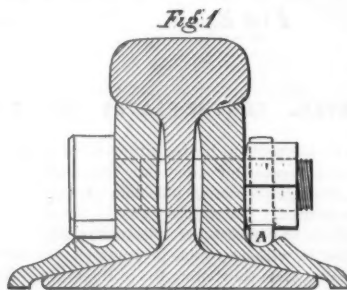
On the 27th there was a butting collision between a passenger train and a switching engine on the Atlantic Division of the Long Island road, in Brooklyn, N. Y. Both engines and a car were damaged.

Very early on the morning of the 30th, on the Chicago & Northwestern road, between Brooklyn and Oregon, Wis., on a curve, there was a butting collision between two passenger trains, both running at high speed. Both engines were completely wrecked and several cars badly broken, the cars being thrown off and scattered along on both sides of the track. Five persons were slightly hurt. It is said that the operator at Oregon had orders to hold the east-bound train, but failed to do so.

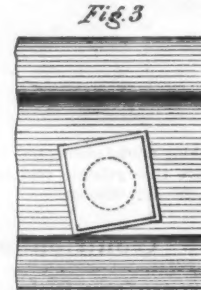
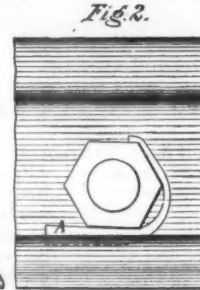
On the evening of the 31st there was a butting collision between two freight trains on the Central Pacific road near Bronco, Nev., by which both engines and 10 box cars were piled up in a very bad wreck. It took nearly a day to clear the road.

## DERAILMENT, BROKEN RAIL.

Very early on the morning of the 26th a freight train on the St. Louis, Iron Mountain & Southern road was thrown from the track at Garner, Ark., by a broken rail. The en-



"CAMBRIA" RAIL SPLICE.



gine was wrecked, the engineer killed and the fireman hurt.

## DERAILMENTS, BROKEN TRUCK.

On the 9th three cars of a freight train on the Nashville, Chattanooga & St. Louis road were thrown from the track near Huntingdon, Tenn., by the breaking of a truck. The road was blocked two hours.

On the morning of the 14th the baggage car of a passenger train on the New York, Lake Erie & Western road was thrown from the track by the breaking of a truck in the Bergen Tunnel, N. J. A brakeman was thrown against the wall of the tunnel and killed.

## DERAILMENTS, BROKEN BRIDGE.

On the afternoon of the 8th a bridge on the Texas & Pacific road, near Clarksville, Tex., gave way under a passenger train, owing to the washing out of the abutment by high water. Three cars went down, and were badly broken, killing one passenger and injuring five others.

On the 17th the bridge over Root River, near La Crescent, Minn., on the Chicago, Clinton, Dubuque & Minnesota road, gave way under a passenger train, and two cars were thrown down into the stream. Although they were damaged, no one was hurt. The abutment of the bridge had been undermined and partly washed away by a freshet, leaving it resting on a very slight foundation.

On the 17th a bridge over the Tippecanoe River, near Monticello, Ind., on the Pittsburgh, Cincinnati & St. Louis road, gave way under a freight train, and the engine and 22 cars went down into the river, and were piled up in a bad wreck. The engineer was killed, as was also the bridge watchman, who stood on the bridge when it went down, and four passengers, who were in the rear car, were hurt.

On the morning of the 30th a bridge near Clarksville, Ark., on the Little Rock & Fort Smith road, gave way under a passenger train, and the rear car was thrown into the river and wrecked, injuring three passengers. The abutments had been undermined by a freshet.

## DERAILMENTS, WASH-OUT.

On the afternoon of the 4th a freight train on the Allegheny Valley road ran into a gap near Ross, Pa., where a culvert had been washed out by a sudden and violent storm. The engine and several cars were wrecked and three trainmen hurt.

Late on the night of the 12th the engine and two cars of a passenger train on the Cincinnati, Richmond & Fort Wayne road ran into a wash-out near Decatur, Ind., doing some damage.

On the afternoon of the 29th a freight train on the Central Branch, Union Pacific, ran into a washed-out culvert near Palmer, Kan., the engine going down into the gap with a flat car on top of it.

## DERAILMENTS, SPREADING OF RAILS.

On the 1st the engine and two cars of a passenger train on the Rutland Railroad were thrown from the track by the spreading of the rails near Cavendish, Vt., blocking the road three hours. The spreading is said to have been caused by unusual expansion, owing to the extreme heat.

On the 3d a passenger train on the Boston, Concord & Montreal road was thrown from the track by the spreading

of the rails at Forest Crossing, N. H., and the engine and several cars damaged, injuring the engineer and fireman slightly. The spreading was caused by undue expansion of a rail, owing to the great heat of the day.

On the morning of the 10th several cars of a passenger train on the Long Island road were thrown from the track at Ocean Point, N. Y., by the spreading of the rails.

On the 10th the engine and baggage car of an express train on the Philadelphia, Wilmington & Baltimore road were thrown from the track near Stanton, Del., by the spreading of the rails resulting from unusual expansion caused by the great heat. The train was delayed over an hour.

## DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the 8th a passenger train on the St. Louis & South-eastern road ran into a tree which had fallen across the track near Earlington, Ky. The engine was thrown from the track and upset and the baggage car fell over on its side.

On the 16th four cars of a coal train on the Utica, Clinton & Binghamton road were thrown from the track in Utica, N. Y., by a broken draw-head falling on the track.

On the 16th a freight train on the Atlantic, Mississippi & Ohio road struck a tree, which had been blown down across the track near Big Lick, Va. The engine was thrown from the track and badly damaged and the engineer hurt.

On the morning of the 23d two cars of a Winona & St. Peter freight train were thrown from the track at Mankato, Minn., by the breaking of a coupling which fell on the rail.

Early on the morning of the 31st some cars of a freight train on the Pennsylvania road were thrown from the track at Lawrence, N. J., by a brake-beam which dropped down on the rails. One car was badly wrecked.

## DERAILMENTS, CATTLE.

On the evening of the 2d a passenger train on the New York, Lake Erie & Western road ran over a cow in Passaic, N. J., throwing one car from the track.

On the morning of the 15th a freight train on the Baltimore & Ohio road ran over a mule near Martinsburg, W. Va., and two cars were thrown from the track and wrecked, blocking the road two hours.

Early on the morning of the 20th a freight train on the Baltimore & Ohio road struck a cow on the track near North Mountain Run, W. Va. The engine was thrown from the track and ran a short distance on the ties, when it reached a bridge and upset, falling 75 feet into a ravine. The engine was wrecked, the fireman killed and the engineer fatally hurt. In falling the engine broke loose from the train and none of the cars left the track.

On the morning of the 23d a freight train on the North Pennsylvania road ran over a cow near Ambler, Pa., and the engine and three cars were thrown from the track and piled up in a bad wreck.

## DERAILMENTS, MISPLACED SWITCH.

On the 5th a passenger train on the New York, Lake Erie

& Western road was thrown from the track by a misplaced switch at Rathbone, N. Y.

Very early on the morning of the 14th the engine of a freight train on the Pennsylvania road was thrown from the track by a misplaced switch at Southwest Junction, Pa. It rolled down a bank 30 feet.

On the evening of the 25th a yard engine and four freight cars on the Pittsburgh, Fort Wayne & Chicago road were thrown from the track by a misplaced switch in the yard at Allegheny, Pa.

On the morning of the 31st three cars of a freight train on the Pittsburgh, Cincinnati & St. Louis road were thrown from the track by a misplaced switch at Mansfield, Pa.

## DERAILMENTS WITH MALICIOUS INTENT.

On the morning of the 6th a freight train on the Pittsburgh, Cincinnati & St. Louis road was thrown from the track at West Lafayette, O., by a misplaced switch, the engine being upset and six cars badly damaged. The switch had been set wrong, and a nut jammed down between the rails by some person unknown. Two trainmen were slightly hurt.

On the evening of the 8th, the small dummy-engine used by the officers of the Philadelphia & Reading road was thrown from the track near Shamokin, Pa., by a switch which had been purposely misplaced. The engine was damaged, and the fireman hurt. After the engine was off, some stones were thrown at it from the bushes.

## DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the morning of the 7th the engine and two cars of a passenger train on the Savannah, Skidaway & Seaboard road ran off the track near Savannah, Ga., blocking the road several hours.

On the afternoon of the 8th several cars of a freight train on the Chicago, St. Paul & Minneapolis road were thrown from the track and piled up together near Menomonie, Wis. The road was blocked some nine hours.

Early on the morning of the 9th the caboose of a freight train on the Detroit, Lansing & Northern road ran off the track near Green Oak, Mich., and one man was hurt.

On the afternoon of the 11th the engine of a passenger train on the Utah Southern road ran off the track at Pleasant Grove, Utah, blocking the road some time.

On the afternoon of the 11th some cars of a freight train on the Chicago & Alton road ran off the track near Louisiana, Mo. The caboose upset and was badly broken, injuring six persons who were in it at the time.

On the night of the 15th a car in a freight train on the Lake Shore & Michigan Southern road ran off the track and into the lake at the breakwater in Cleveland, O.

On the evening of the 16th some cars of a freight train on the Pittsfield & North Adams Branch of the Boston & Albany ran off the track in the yard at North Adams, Mass.

On the 24th four cars of a freight train on the Buffalo, New York & Philadelphia road ran off the track at Allegheny, Pa.

On the evening of the 25th, as a passenger train on the Baltimore & Ohio road was entering the yard at Camden Station in Baltimore, Md., the rear truck of the smoking car jumped the track at a frog and ran off on a side track. The train continued for several yards with the two trucks of the smoking car running on separate and diverging tracks, when the car was



twisted around and raised high in the air. The rear truck was elevated at least 20 feet from the ground, and the forward truck torn off. The accident to the smoking car caused the other cars to leave the track, and some of the trucks getting on diverging tracks, the train was twisted up in a remarkable manner before the engineer could apply the brakes. The smoking car had to be pulled in two to clear the track.

On the morning of the 27th a freight train on the Richmond & Petersburg road, ran off the track at Halfway, Va., blocking the road three hours.

On the evening of the 29th several cars of a freight train on the Chicago, Burlington & Quincy road ran off the track near Colmar, Ill., blocking the road three hours.

#### OTHER ACCIDENTS.

On the morning of the 10th, as an express train on the Pennsylvania Railroad was near Millstone Junction, N. J., a parallel rod broke, wrecking one side of the engine, and injuring the engineer slightly.

On the evening of the 31st, as an express train on the Central Railroad of New Jersey was near Dunellen, N. J., a parallel rod broke, damaging the engine considerably.

This is a total of 54 accidents, by which seven persons were killed and 41 injured. Five accidents caused the death of one or more persons; 19 caused injuries less than death, leaving 37, or 68.5 per cent. of the whole number, which caused no injury serious enough for record.

As compared with July, 1877, there was an increase of one accident, a decrease of 14 in the number killed, and of 103 in that injured. July of last year had an unusually large proportion of casualties.

These accidents may be classified according to their nature and causes as follows:

COLLISIONS:	
Rear collisions.....	6
Butting collisions.....	6
<b>Total.....</b>	<b>12</b>
DERAILMENTS:	
Unexplained.....	11
Broken rail.....	1
Broken truck.....	2
Broken bridge.....	4
Wash-out.....	3
Spreading of rails.....	4
Accidental obstruction.....	5
Cattle on track.....	4
Misplaced switch.....	6
<b>Total.....</b>	<b>40</b>
Broken connecting rod.....	2
<b>Total.....</b>	<b>54</b>

One collision was caused by a misplaced switch, one by a runaway engine and one by a mistake in orders; an unusual number are unexplained. Of the broken bridges three gave way on account of the undermining of abutments by water; no cause is given for the failure of the fourth. Two switches were purposely misplaced. There were 14 accidents traced directly to defect or failure of road or equipment.

Of the collisions three were between passenger, three between passenger and freight, and six between freight trains; 15 derailments were of passenger and 25 of freight trains, and the two other accidents were to passenger trains. The 12 collisions injured 12 persons; the 40 derailments killed seven and injured 28, and the two other accidents injured one man.

The extreme heat of the early part of the month appears as a cause of accident, three cases of spreading of rails being attributed to unusual expansion of the iron. There were only two malicious derailments reported, both by misplacing switches. The number of switches carelessly left wrong is unpleasantly large, and it is evident that there is too little watchfulness on many roads, as far as the switches are concerned. Wash-outs are in considerable number are usual at this time of year, and three of the broken bridges were really due to this cause. Cattle at this season are also a frequent cause of trouble. The butting collisions equal the rear collisions in number, which is somewhat unusual.

For the year ending with July the record is as follows:

	No. of accidents.	Killed.	Injured.
August.....	98	46	220
September.....	84	20	88
October.....	82	31	112
November.....	83	23	70
December.....	66	8	26
January.....	75	23	77
February.....	67	8	31
March.....	49	5	14
April.....	46	12	55
May.....	50	13	44
June.....	56	12	58
July.....	54	7	41
<b>Totals.....</b>	<b>810</b>	<b>208</b>	<b>836</b>

The averages per day were, for the month, 1.74 accidents, 0.23 killed and 1.39 injured; for the year, 2.22 accidents, 0.57 killed and 2.59 injured. The average casualties per accident for the month were 0.130 killed and 0.759 injured; for the year they were 0.257 killed and 1.332 injured. The averages for the month were all below those for the year.

#### Protection of Passengers.

Railroad companies make contracts to carry passengers from one place to another; and clearly this contract is not performed unless the passenger is carried safe and sound. The companies are under a grave public duty, also, to the same purpose. For they are allowed to lay out their routes through the country, cut through farms, tear down buildings, cross highways and disturb the peace of the earth generally, in consideration of their undertaking to provide a safe and rapid mode of travel. But this duty is not performed unless people are carried safely. To take a passenger on a train at New York and deliver him beaten and bruised, or robbed, or cut in pieces, at Chicago or Boston, is not a performance either of the contract or of the public duty. Hence the more recent decisions are recognizing very stringently the doctrine that railroads have a duty in protecting their passengers against violence and robbery. Directors are bound to provide reasonable means, and prescribe proper regulations for the safety of passengers; and conductors are bound to make their best efforts in the same direction. This principle applies, also, to steamboats and sail vessels. In short, all who engage in the business of carrying passengers must carry them safely.

The principle was strikingly illustrated a number of years ago in the trial of Holmes. He was a seaman on board the ship *William Brown*. She sailed from Liverpool for Philadelphia, and struck an iceberg on the way, and sank; the

crew and about half the passengers got into the boats, and began to make what way they could toward land. The boats were soon separated, and the long-boat, in which Holmes was, struggled along alone. But she was leaky, and overloaded, and after a night and a day of most perilous effort to save all on board, the crew, headed by Holmes, threw overboard several of the passengers as a means of lightening the boat enough to allow of saving some. Holmes had no particular authority in the ship, he was only a common seaman, but he was of remarkable build and endowments, and his good qualities gave him a prominence among the crew. He was the last man to leave the sinking ship, and the foremost in efforts to save all the passengers, and when this seemed impossible, he was foremost in the act of casting some overboard. The boat, with the crew and residue of passengers, was at length rescued by a passing ship and brought to port. Holmes was then put upon trial for manslaughter.

His counsel pleaded in defense that the homicide was necessary; the crew were compelled to cast some overboard that others might be saved. But the Judge charged the jury that such a defense could not be made in behalf of the crew. He said that if two persons who owe no duty to one another cannot both survive, neither commits a crime by saving himself at the expense of the other. But this does not apply to persons who have undertaken to carry passengers. They are bound to transport the passengers to the place of destination. The passenger owes no duty to protect the carrier, but the carrier owes the highest duty to save the passenger. And when the ship is wrecked, and passengers and crew are adrift in the boats, the sailors are still bound to undergo whatever hazard is necessary to preserve the passengers. And Holmes was convicted and sentenced. This was a good while ago; but the doctrine is not old-fashioned or obsolete; on the contrary, the tendency of recent decisions, especially as toward railroad corporations, is to recognize the duty of protecting passengers more and more distinctly.

In a case decided not quite two years ago, in Mississippi, a party of drunken rowdies, passengers on a railroad train,

commenced "saucing" a peaceable passenger sitting near them, and at length pulled off his hat and commenced tossing it about. He applied to the conductor to protect him, and the conductor did begin a remonstrance. But this only excited the rowdies to a general scuffle; the conductor ignominiously ran away into the rear car, and the unfortunate passenger was beaten and injured, though not seriously. He sued the company for damages. The counsel argued that a railroad company is not bound to protect one passenger against another. But the court decided that this is not so. A company is bound to make wise and efficient arrangements to carry passengers safely, including keeping order among passengers. And if a conductor will not interfere and call brakemen to help him if need be, to protect one passenger from violence or robbery by another he neglects his duty and renders his company liable. The same doctrine was enforced in a case toward the close of war times, where a quiet, orderly passenger was accidentally shot by a musket dropped by one of a quarrelsome, intoxicated party of soldiers who were traveling along with him. The court said that the railroad company was bound to exercise the utmost vigilance and care in keeping order, and if they took drunken soldiers on board they must make corresponding arrangements to keep them quiet. And there was a case in a Southern court, where merchants sent their clerk on a journey with a large sum of money in charge; he fell into company with gamblers on board a steamboat, and was fleeced of the money, and the merchants were allowed to recover their money against the vessel, for the court said they ought to have made efforts to prevent the gambling. This particular case goes further than can be relied upon as law. But there is no doubt the law enforces great care in the protection of passengers.—*New York Times*.

—Mr. M. D. Hays has resigned his position as President of the Pittsburgh & Castle Shannon Railroad Company. Mr. Hays continues to be President of the Pittsburgh Southern Company.

#### LOCOMOTIVE RETURNS, MAY, 1878.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Number of miles operated.	Number of Locomotives in service.	MILEAGE.		NO. MILES RUN TO			Average No. of freight cars hauled.	Average cost per freight car per mile, cents.	COST PER MILE IN CENTS FOR						AVERAGE COST OF		
			Total.	Average per Engine.	Coal.	Wood.	Oil.			Repairs.	Fuel.	Stones.	Miscellaneous.	Engines, firemen and wages.	Total.	Coal per ton.	Wood per cord.	
Allegheny Val., River Div.*	130	38	80,580	2,121	43.06			29.37	23.40	1.075	7.05	3.22	0.42		6.29	16.98	1.30	1.83
Low Gr'de Div.*	120	17	32,484	1,911	32.60			21.40	20.90	0.812	3.47	3.68	0.61		6.18	13.94		
Atlantic & Great Western, 1st & 2d Divs.	228	83	194,055	2,338	41.32			17.53	16.50		4.39	4.02	0.49	0.78	5.39	16.51	1.92	2.82
3d & 4th Divs.	197	50	136,143	2,723	39.36			22.56	15.50		4.19	4.47	0.33	0.62	5.46	15.07	1.64	2.82
Mahoning Div.	88	51	100,864	1,978	48.07			21.43	18.00		4.92	4.26	0.34	0.55	5.99	15.70	1.91	2.82
Atlantic & Gulf.	343	20	52,912	2,645		58.69		20.16			4.40	2.98	0.44		7.08	15.50		1.75
Cairo & Vincennes.	157	11	28,542	2,594	44.40			15.60			5.17	2.65	0.33		5.19	13.34	1.15	
California Pacific.	152	11	25,853	2,350	48.47			20.45			2.51	12.92	0.47	0.45	7.96	24.11	6.00	5.75
Gen. Pac., Western Div.†	227	57	149,400	2,621	44.00			16.59			6.67	13.88	0.51	0.51	7.54	29.11	6.00	5.75
Visalia Div.†	157	10	24,208	2,427	50.45			15.72			13.66	12.05	0.50	0.63	6.02	33.46	6.00	5.75
Tulare Div.†	171	12	28,341	2,353	45.61			13.12			3.19	13.34	0.62	0.16	7.55	24.86	6.00	5.75
Los Angeles, San Diego, Yuma & Wilmington Divs.	408	19	46,913	2,469	56.84			14.91			5.14	10.74	0.53	0.10	7.49	24.06	6.00	5.75
Sacramento Div.†	120	34	82,553	2,428		27.46	16.41				7.75	20.94	0.51	0.34	9.39	38.93		5.75
Oregon Div.†	152	7	19,675	2,811	43.89	38.30	18.02				2.66	15.41	0.46	0.27	8.43	27.23	6.00	5.75
Truckee Div.†	205	24	62,178	2,591	37.95	30.77	18.35				7.03	17.18	0.44	0.42	8.67	33.64	6.00	5.75
Humboldt Div.†	201	20	48,551	2,428	42.52		21.41				11.78	14.33	0.38	0.43	7.70	34.62	6.00	5.75
Salt Lake Div.†	219	27	72,382	2,681	33.61		15.23				7.76	18.03	0.56	0.53	7.62	34.50	6.00	5.75
Chi., St. Louis & New Orleans, Tenn. & Ky. Div.	107	19	39,615	2,085	43.50	26.10	24.70				3.80	7.80	0.40		6.00	18.00	3.00	2.25
Cleve., Col., Cin. & Ind., Columbus Div.	138	56	158,406	2,830	44.93		30.55				2.61	3.73	0.45	0.61	6.01	13.41	1.55	2.75
Indianapolis Div.	203	64	187,598	2,931	46.66	50.91	23.03				3.62	4.26	0.53	0.96	5.71	15.08	1.75	2.75
Cincinnati Div.	130	34	81,938	2,410	44.73	50.00	26.69				3.59	3.90	0.60	0.98	6.84	14.95	1.55	3.00
Cleveland & Mahoning Valley.	41	6	13,803	2,301	56.80	23.79	9.20				0.64	3.23	0.29	1.25	6.28	11.69	1.06	2.63
Cleveland & Pittsburgh*	225	80	171,752	2,147	51.95		17.22	17.00	0.724		3.63	2.63	0.45	1.66	6.00	14.67	1.20	3.16
Del., Lackawanna & Western, Bloomsburg Div.†	80	20	44,115	2,206			31.97				3.05		0.52		4.92	9.39		1.59
Erie & Pittsburgh.	98	29	72,105	2,486	41.14		20.63	18.20	0.732		2.38	3.87	0.43	1.31	6.32	14.31	1.59	1.59
Green Bay & Minnesota.	240	14	27,177	1,941		33.38	12.44	13.86			2.67	7.49	0.58	0.07	4.90	15.71		2.50
Houston & Texas Central.	498	50	139,235	2,390	52.72	42.15	10.10				4.33	6.98	0.60	0.98	6.51	19.42	3.50	3.35
Ill. Cen., Chicago Div.†	253	64	151,812	2,372	35.73		16.81	18.58			2.12	5.23	0.28		5.78	13.42	1.75	4.20
South Div.†	231	32	69,831	2,282	39.88		14.92	15.44			4.93	4.08	0.30		5.71	15.64	1.75	4.20
North Div.†	225	38	86,700	2,282	36.26		13.31	14.86			6.97	5.10	0.33		5.66	16.08	1.75	4.20
Springfield Div.†	113	9	19,339	2,149	44.25		15.80	12.86			3.88	3.54	0.33		5.66	13.42	1.45	2.65
Iowa Div.†	401	43	108,290	2,518	29.15		16.27	13.85			4.22	0.19	0.39		5.96	19.67	2.00	4.90
Indianapolis, Cincinnati & Lafayette.	226	42	101,321	2,412	38.50		20.64				2.61	5.14	0.27		5.63	13.65	1.75	1.75
Jeff'ville, Madison & Ind's.*	226	41	90,533	2,209	50.03	33.93	15.23	17.98	0.900		4.66	5.35	0.41	1.42	5.70	17.54	2.50	2.25
Kansas Pacific.	721	70	201,201	2,875	27.25		12.87				5.33	11.03	0.43		6.36	23.15	3.00	3.28
Kansas City, St. Jo. & Council Bluffs.*	271	31	98,915	3,191	45.40		26.80	18.30			4.10	6.20	0.30		6.50	17.10	2.65	3.50
Lake Shore & Mich. Southern, Buffalo Div.*	80	13	187,306	2,104	41.57	40.39	24.41				3.34	7.22	0.28		6.78	16.66	2.85	5.69
Erie Div.*	113	23	223,116	1,974	37.80	29.19					4.06	7.06	0.28		5.72	17.13	2.52	5.43
Toledo Div.*	85	14	149,440	1,762	31.28	66.84	21.23				4.82	0.31	0.33		5.83	20.32	2.92	4.08
Mich. Southern Div.*	208	1	146,439	2,002	41.22	63.96	24.37				4.44	8.02	0.26		5.86	18.49	3.35	4.63
Little Rock, Miss. River & Tex. Louisv'e & Nash., First Div.*	100	4	5,019	1,255		79.00	13.00				8.30	2.80	0.50	3.20	9.60	24.40		2.25
Second Div.*	332	1	108,397	2,282	31.25	38.04	11.23				3.64	6.47	0.47	1.33	7.06	18.97	1.95	2.51
Memph. Div.*	200	1	76,714	2,392	33.00	11.83					6.54	5.70	0.43	1.84	6.05	30.56	1.82	2.73
Nashville & Decatur Div.*	131	1	36,001	2,282	34.50	13.22					5.17	8.34	0.48	1.88	6.24	22.11	2.85	2.85
S. & N. Alabama R. R.†	183	1	40,249	2,262	35.75	14.48					4.11	6.79	0.51	1.35	6.24	19.00	2.35	3.00
Marq., Hought'n & Ontonagon	88	24	30,942	1,289	41.77	24.80	65.32				1.02	9.98	0.47		6.01	17.48	4.00	
Northern Central, Elmira & Canandaigua Divs.	147	44	99,081	2,252	36.50	18.52					5.39	5.08	0.60		5.81	16.88	1.80	2.00
Penn., New York Div.††	120	118	284,719	2,413	38.10	11.30					4.70	8.60	0.90		14.20	3.20	4.72	
Amboy Div.††	154	38	75,678	1,962	58.28	22.42					5.40	5.60	0.40		11.40	3.20	4.72	
Belvidere Div.††	103	35	53,298	1,523	43.04	17.01					4.50	7.00	0.60		12.70	3.20	4.74	
Philadelphia Div.††	191	165	388,892	2,355	29.12	15.43					4.00	4.40	0.60		9.00	1.20	2.72	
Middle Div.††	132	90	268,392	2,082	33.75	18.38					3.80	3.70	0.50		8.00	1.20	2.72	
Pittsb'gh Div.††	221	196	434,658	2,218	29.10	13.23					5.50	4.20	0.60		10.30	1.20	2.72	
Tyrone Div.††	107	26	50,003	1,923	23.28	26.74					7.90	5.20	0.50		13.60	1.20	2.73	
West Penn. Div.††	104	20	43,530	2,177	44.96	20.33					4.10	2.80	0.30		7.20	1.20	2.73	
Lewistown Div.††	56	5	9,085	1,817	43.71	27.47					4.10	2.80	0.40		7.30	1.20	2.86	
Bedford Div.††	57	4	7,067	1,767	31.39	26.60					5.80	3.80	0.30		9.90	1.20	2.83	
Pitts., Fort Wayne & Chicago, Elkhart Div.*	371	150	397,153	2,648	46.47	19.02	16.20	0.810			5.25	3.26	0.46	1.72	6.14	14.13	1.62	1.62
Western Div.*	280	103	299,576	2,909	44.50	18.00	24.70	0.544			3.08	3.60	0.37	0.26	5.85	15.56	1.60	1.50
Pitts., Cin. & St. Louis, Little Miami Div.*	197	39	97,700	2,507	46.38	13.67	17.19	0.794			4.59	4.00	0.49	1.89	5.60	17.17	2.10	2.00
P. C. & St. L. Div.*	224	87	228,208	2,623	33.95	23.94	19.20	0.750			6.27	4.47	0.38	2.55	5.05	17.32	0.75	2.50
Pittsb'gh, Titusville & Buffalo*	158	22	45,680	2,076	53.92	20.47	14.80	0.854			3.45	3.14	0.50		6.04	13.13	1.54	3.35
St. Louis, Iron Mt. & So., Ar. Eastern Div.	325	32	76,450	2,389		53.90	16.10				3.74	4.63	0.48		6.06	14.91		2.50
St. Louis & San Francisco.	328	1	72,073		37.00		14.50				3.05	6.08	0.34		5.75	14.82	2.10	1.80
St. Louis & S. E., St. L. Div.	208	1	55,885		44.80		21.20				4.69	2.37	0.25		5.58	12.29	0.95	
Nashville Div.	145	1	53,569		38.10		18.70				4.39	2.03	0.26		5.80	12.48	0.74	
Stockton & Copperopolis.	49	3	4,284	1,428	48.47	20.45					2.72	15.94	0.74	0.66	8.39	28.45	6.00	5.75
West Jersey††	128	17	37,615	2,213	53.55	25.00					4.80	7.20	0.40		12.40	3.80	4.04	





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## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbid-den to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inven-tions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad offi-cers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their man-agement, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially de-sired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and es-pecially annual reports, some notice of all of which will be published.

## A WAY OF REDUCING EXPENSES.

A late number of *The Engineer* contains the follow-ing editorial paragraph:

"It is sometimes argued that little or nothing is to be gained by effecting even moderate economy in the con-sumption of fuel on railways. It is urged that coal is so cheap, and that the money paid for it bears so small a pro-portion to other forms of expenditure, that it is not worth while to take much trouble to save fuel. We have also heard it stated that the modern English locomotive burns as much fuel per train mile as those built ten or even twenty years ago, and that no improvement has been or can be effected on past practice in this respect. As a practical com-ment on such reasonings, we may state that during the last half-year the consumption of fuel for locomotive pur-poses has been reduced on the London, Brighton & South Coast Railway by about 5,000 tons, as compared with any previous half-year during which the traffic—goods and pas-senger—was nearly as heavy. Coal costs the company very nearly £1 sterling per ton, so that the saving represents £5,000. At the last meeting of the company, dividends of £2 2s. 6d. on the undivided ordinary stock, and £3 per cent. on the preferred ordinary stock for the half-year were de-clared. The amount absorbed by these dividends was £126,250, and left £33,624 to be carried forward. It will be seen, therefore, that nearly 4 per cent. of the whole sum absorbed in paying the dividend resulted from the saving effected in the consumption of coal."

This saving is attributed to the use of new locomotives of improved construction and design. Most rail-road managers will, however, say at once that if this economy must be purchased at the cost of new equip-ment, the expense will amount to very much more than the saving, which, in most cases, would probably be true. But is there no other way in which the con-sumption of fuel may be diminished? Is the highest economy attained by simply doing nothing, by keep-ing no account of what becomes of fuel, of allowing each locomotive runner to use as much as he chooses or keeping no record of the performance of engines of different design and construction? On perhaps the majority of the railroads in this country no ac-count of the consumption of fuel in different engines and by the different men which is at all correct is kept. Each man runs his engine up to the fuel bin and takes on what he needs and burns all he chooses. The enormous waste which such a

system or want of system entails may be imagined, but is certainly not realized by the managers in charge. Generally the latter ease their minds by the reflection that the cost of keeping account of fuel consumption will amount to more than it comes to, and at any rate it is a great bother to do it and will increase the office expenses, which somehow many managers regard as quite unproductive and useless.

Now it should be very easy of demonstration whether it is profitable to keep account of fuel consumption or not, the chief difficulty being in determining what the cost will be of keeping such account, a matter about which there is unfortunately considerable difference of opinion among practical railroad men. Whether an account is kept or not, there will be some cost for handling fuel from the cars on which it is transported to the tenders from which it is used. To weigh or measure the coal for each engine, keep an account of it and also of the cars hauled, which must be done if the accounts are to have much value, will add to the cost of handling. Besides these expenses, ordinarily it is necessary to provide some facilities, such as bins, pockets, cranes or scales for weighing or measuring the fuel. Interest on the extra cost of these and the expense of maintenance and renewal must also be paid. But usually when such facilities are provided, the cost of simply handling the fuel is ma-terially diminished, and therefore credit should be given for this diminution of expense. The question will therefore be, first, what does it cost, without keeping any account, to handle the fuel from the cars to the tenders, which expense we will say = *a*? and, second, what will be the cost of handling and keeping account with the appliances needed for measuring and weighing per ton, including accounting, car mileage and maintenance and renewal of the structures needed for handling the fuel, which will be represented by *b*. Now if the cost per ton for fuel, multiplied by the percentage of saving which can be effected, amounts to more than the difference be-tween *a* and *b*, then it will be economical to keep such account, but if the saving is less, then, as the practical men put it, it will cost more than it comes to. Any railroad officer ought to be able to determine the cost or value of *a*, and a sufficient number of railroad com-panies now keep account of the fuel consumption to supply data which will at least approxi-mately determine the value of *b*. It is evident, though, that if coal cost \$2 per ton, and it costs 10 cents per ton for handling it, without keeping account, and 5 cents more for weighing and accounting, then a saving of 2½ per cent. of the fuel will pay for all the extra cost, and a saving of 10 per cent. of the fuel will result in a net economy of 7½ per cent. On a road like the Erie, or New York, Lake Erie & Western as it called now, where the fuel account amounts to about a million of dollars, this saving would be equivalent to the snug sum of \$75,000. Our figures are quite hypo-thetical, but any railroad manager or superintendent can make the investigation for himself. It is of course true that the mere fact of keeping account of fuel con-sumption of itself does not save money, but it supplies such information as leads inevitably to economy. Keep-ing a cash account does not produce any value, and yet a merchant or manufacturer who should attempt to economize by dismissing his cashier and abolishing his cash-book would be considered a lunatic.

As to the amount of economy which will result from keeping a careful account of the fuel, it is impossible to speak with any certainty. There is this significant fact, however, that those who do keep such accounts all estimate the economy which may be effected much higher than those who do not know where their fuel goes to. It should be borne in mind, though, that if the consumption of fuel is estimated per train mile, it is quite certain to be misleading, as it is no sure in-dication of the amount of work done. What must be known, in order to follow the subject up closely, is the fuel consumption *per car mile* as well as *per train mile*. On one road on which such an account has been kept for less than a year, the saving is estimated at over 10 per cent., although the account has not been kept in its present form long enough to compare the corresponding months of different years. On the Penn-sylvania road the saving effected has exceeded the ex-pectations of those who adopted the system, and the officers on that line now say that there is apparently no limit below which the consumption of fuel may not be reduced. Besides merely keeping account of what becomes of fuel on that line, a system has recently been adopted which makes it the direct interest of each locomotive runner and fireman to save all the fuel he can. The plan adopted a few years ago was to classify the engines and allow them on different divisions of the line a certain amount of fuel per car per mile. If the men in charge of the engines ran for the month with less than the specified amount they

received a premium. This plan had the advantage over that of giving a premium to the *best* man that all could compete successfully for the extra pay, whereas when one premium was given to the best man many grew hopeless and gave up trying. But the first plan adopted by the Pennsylvania road had this disadvantage, that it offered no in-ducement to the men to do more than just come within the limit which would secure the premium. The system was therefore adopted of paying the men a bonus equal to half the value of all the coal they could save below the amount at which the engines are rated. All the men are therefore interested in doing the very best they can. The result is said to be most satisfactory. Never before has there been such rivalry or rather so much effort made to run and fire their en-gines economically. Every master mechanic who has ever tried knows how hard it is to induce locomotive runners to regulate the supply of steam by the re-verse lever and not by the throttle. Instruction is in vain and orders useless to induce them to use the steam expansively by cutting off short in-stead of throttling it. When the new order was promulgated and it was found that fuel could be saved by cutting off steam short, the men soon complained that there were not notches enough in the sectors, and they wedged up the latch in order to adjust the lever more accurately. Very soon an ingenious me-chanic made a block which answered the purpose better, and with which the men were supplied, and which now goes by the name of a "bonus block." The degree of economy which is effected may be judged from the fact that the engines have first been rated at a fair amount of fuel per car per mile. This rate would certainly be exceeded if no account was kept of the fuel burned. Not only do most of the men not exceed this, but some of them make a bonus of from \$15 to \$20 per month. Of course the railroad company makes an equal amount. The fact, though, that some of the runners do not keep their fuel consumption below the amount at which the engines are rated shows the difference between the work of men who are skillful and those who are not. The waste which is sure to result when, besides being unskillful, they are also indifferent, can be imagined, but not estimated.

The economy resulting from the Pennsylvania sys-tem is due, not as in the case of the London, Brighton & South Coast Railway quoted above, to any special improvements in the locomotives, but to the fact that the men themselves have a direct interest in what they can save, and also in learning and knowing how to save fuel. The effect of this system will be to train a more skillful class of men, and in doing this to improve them mentally and morally.

Of course, just so soon as any improvement in loco-motive construction is adopted, it would be recognized, and as the engines on that line are run by different sets of men, whenever the performance of a locomotive was below what it should be, or better than the rest, the defects or merits would be recognized and valued accordingly. The effect of this will inevitably be to secure the most efficient engines and the adoption of any improvement which is of real value.

The surprising thing about this whole subject is that so many railroad companies should so neglect an ex-pense which counts by hundreds of thousands of dollars, and that whatever economy or waste there is should be left to chance and not be subject to the most careful scrutiny.

## Atlantic Grain Receipts.

The receipts of grain of all kinds at the seven Atlan-tic ports for the seven months from Jan. 1 to Aug. 3 of the past two years have been, in bushels, with the percentages of the total received at the several ports:

	—1878—	Per cent.	—1877—	Per cent.
	Bushels.	of total.	Bushels.	of total.
New York.....	59,543,035	46.2	26,144,040	39.0
Boston.....	10,503,939	8.2	6,651,006	9.9
Portland.....	1,466,509	1.1	730,593	1.1
Montreal.....	5,672,148	4.4	3,783,778	5.6
Philadelphia.....	21,880,110	17.0	9,513,840	14.2
Baltimore.....	21,821,500	16.9	15,422,084	23.0
New Orleans.....	7,977,997	6.2	4,878,231	7.2
Total.....	128,865,838	100.0	67,124,592	100.0

The increase in the aggregate receipts having been 92 per cent., it is not remarkable that there has been a considerable increase in the quantity received at every market. But in percentages of the totals only New York and Philadelphia show gains. Boston, Montreal, New Orleans and Baltimore all lose, and the latter most of all—indeed, more than all others put together.

Comparing New York with Philadelphia and Balti-more taken together, we have the following per-centages:

	1878.	1877.
New York.....	46.2	39.0
Philadelphia and Baltimore.....	33.9	37.2
The three ports.....	80.1	76.2



And comparing New York and Boston together with Philadelphia and Baltimore together, we have:

	1878.	1877.
New York and Boston.....	54.4	48.9
Philadelphia and Baltimore.....	33.9	37.2
The four ports.....	88.3	86.1

Neither Montreal nor New Orleans have carried as large a proportion of the grain as last year, in spite of the improved outlet of the Mississippi at the latter place, and four weeks' more navigation at the latter. The four leading markets have got more than seven-eighths of the whole.

While navigation was closed last winter there was a very active grain movement, and the distribution depended entirely upon the railroads, except the small part that went to New Orleans. When navigation opened the conditions changed radically, New York and Montreal having each a channel for receipts opened to them, and these cheaper than the rail routes, by which the distribution was effected in the winter. It therefore becomes interesting to compare the receipts while navigation has been open, which we do below for the 14 weeks from April 28 to Aug. 3, when navigation was fully open both years:

	1878.	Per cent.	1877.	Per cent.
	Bushels.	of total.	Bushels.	of total.
New York.....	34,489,073	50.1	16,807,696	47.8
Boston.....	5,635,800	8.2	2,698,148	7.8
Portland.....	188,788	0.3	109,600	0.3
Montreal.....	5,627,030	8.2	3,878,578	10.6
Philadelphia.....	10,280,750	14.9	3,919,890	11.2
Baltimore.....	9,872,800	14.4	5,524,690	15.9
New Orleans.....	2,691,287	3.9	2,217,531	6.4
Total.....	68,785,528	100.0	34,756,133	100.0

This shows a very different distribution from that of the whole seven months, but not so great a difference in the distribution of the two years.

To show more clearly the effect of the opening of navigation, or at least the changes that have followed the opening of navigation (for they have not all been due to it), we give below the percentages of the total receipts at the different ports for the 14 weeks above, when navigation was fully open, and also for the entire period that navigation was closed last winter, 21 weeks:

	1878.	Navigation	1877.	Navigation
	Open.	Closed.	Open.	Closed.
New York.....	50.1	40.8	47.8	31.4
Boston.....	8.2	7.9	7.8	11.7
Portland.....	0.3	2.0	0.3	1.9
Montreal.....	8.2	0.1	10.6	0.3
Philadelphia.....	14.9	19.5	11.2	17.8
Baltimore.....	14.4	20.9	15.9	29.6
New Orleans.....	3.9	8.8	6.4	7.3
Total.....	100.0	100.0	100.0	100.0

This shows that this year New York has made greater progress in diverting the grain traffic, while it depended on the railroads alone than while it had the aid of the canal. Its winter receipts advanced from 31.4 to 40.8 per cent. of the total from 1877 to 1878; its summer movement only from 47.8 to 50.1. And, so far as Philadelphia and Baltimore are concerned, taking them together they have done somewhat better this year than last while navigation has been open—receiving 29.3 of the total, against 27.1—though they did much worse while navigation was closed—receiving 40.4 against 47.4 per cent. of the whole. It thus appears that the water route has been a less effective competitor for the grain this year than last; and this is doubtless true. Rail rates were higher last year, and this year, the lake vessels and canal boats, though they have taken a much larger quantity than last year, have taken a much smaller proportion of the total. Indeed, last year, until August, the railroads may be said to have been almost out of the market. In the months of June and July, for instance, while the shipments by lake were nearly the same both years, those by rail were 9,000,000 bushels, or 30 per cent. of the whole, this year, and only 5,314,000 bushels, or 20½ per cent. of the whole, last year.

It is not alone lower rail rates—a greater approximation between rail and water rates—that has worked in favor of some of the ports which receive exclusively by rail; but, for a few weeks past, the situation of the newly-harvested grain, which, as we have several times noted, is more accessible than usual to the southern markets. This is likely to give them a larger proportion of the receipts for the rest of the season than they have had heretofore. Baltimore, for instance, which in June got never so much as 13 per cent. of the grain in any one week, for the last five weeks reported has had from 17.7 to 23.3 per cent. of the whole.

Another notable fact is that since the opening of lake and canal navigation, New Orleans has virtually ceased to compete for grain. While during the 14 weeks of open navigation for which our figures are given the aggregate Atlantic receipts are nearly twice as great this year as last, New Orleans receipts are but 22 per cent. greater, and its proportion of the whole has fallen from 6.4 to 3.9 per cent. It is probably almost wholly

for domestic consumption. The fine new crop of winter wheat is situated just where New Orleans could reach it most easily, and for the rest of the season we might expect a fair test of the ability of the Mississippi route to compete with the direct route to the East but for the unfortunate yellow fever epidemic, which will probably prevent any attempt to export by that route before winter. The competition for the winter wheat would not be so much the Mississippi against the lakes and canal as the Mississippi against the railroads, as, except from Northern Ohio and Michigan, this grain cannot reach the lakes except by a considerable rail journey, which takes it away from the most direct route to Baltimore, Philadelphia or New York.

#### New York Railroads in 1876-77.

The report of the New York State Engineer on the railroads of the State for the year ending with September, 1877, reaches us this year August 15, six weeks earlier than that for the previous year, but still very late. It has reports of earnings from 69 steam railroad companies. (There are 212 names of steam railroad corporations in the list, but a large number have no road constructed, and another large number that have road completed lease it to other companies which do not make separate reports of the earnings.) For the preceding year 68 companies reported earnings. The roads reporting worked 8,131 miles of road in 1876-77, against 8,195 the preceding year. Their length in the State of New York was 5,565 in the later, against 5,552 in the earlier year. The whole mileage worked was equipped with 2,733 locomotives, 1,702 first-class and 373 second-class passenger cars, 741 baggage, mail and express cars, and 59,479 freight cars of all kinds. Compared with the previous year there was an increase of 64 locomotives, 32 second-class passenger cars, and 1,671 freight cars, and a decrease of 47 first-class passenger cars, and 172 baggage, mail and express cars. The great decrease in the latter, following a corresponding great increase the previous year, indicates an error somewhere. The increase in motive power and freight equipment is much larger in proportion than the increase in mileage.

There is reported an increase of about 1½ per cent. in the paid-up capital stock of the companies, of 1.6 per cent. in their funded debt, and of no less than 29 per cent., or \$7,400,000, in their floating debt—which, if unpaid coupons are reckoned as floating debt, is easily accounted for. Sometimes, these obligations seem to be considered as in a sort of limbo—not funded, nor yet floating—but they certainly are a debt, and ought to appear somewhere on the balance sheet. Altogether the paid-up stocks and funded and floating debts of the companies reporting amount to \$759,741,000, which is nearly 16 per cent. of the aggregate of the whole United States, and amounts to \$101,570 per mile of road for which capital is reported. The cost of construction and equipment is reported as nearly \$120,000,000 less than the stock and debts, and at the rate of about \$87,500 per mile of road.

The passenger traffic (number carried one mile) is nearly 6 per cent. less than the preceding or Centennial year, but nearly the same as in the year 1874-75. It was carried with a decrease of 4½ per cent. in the passenger-train mileage. The freight traffic (tonnage mileage) was nearly 4 per cent. greater than for the preceding year, and it was carried with an increase of about 4½ per cent. in the freight-train mileage. The average passenger-train load decreased from 51.86 to 51.16; the average freight-train load from 136.54 to 135.95 tons—both insignificant changes. There had been previously an uninterrupted increase in the average freight-train load ever since 1871, when it was only 94 tons, but rather a decrease in passenger-train loads.

The train service of the year was equivalent to 3.4 passenger trains and 6.2 freight trains each way daily (365 days in the year) over the entire mileage worked. There were also 7,389 passenger-train miles and 13,519 freight-train miles, or 20,908 traffic-train miles in all, run to every locomotive owned by the companies, a large number of which, of course, were engaged in yard service.

The gross earnings of the roads were the smallest reported for four years, and \$5,250,000, or 5½ per cent., less than in the previous year. Passenger earnings fell off 6 per cent., and freight earnings (in spite of the increase of 4 per cent. in traffic), more than 5 per cent.; miscellaneous earnings, about 8 per cent. Passenger business yielded 28.1 per cent. of the earnings, freight business, 62.6, and "other" business, including express, mails, etc., 9.3 per cent.

The working expenses of the roads also decreased, and in larger proportion than the earnings, though less in amount. The aggregate decrease was about \$4,000,000, or 6.7 per cent. Thus the decrease in net earnings was only \$1,222,000 or about 4 per cent., and, compared with the earnings in 1875-76, there was an increase of 3½ per cent. The decrease in expenses has been 7 per cent. in maintenance of road, 13 per cent. in maintenance of rolling stock and machinery, and 5 per cent. in transportation expenses. The decrease in working expenses since 1873-74 has been nearly \$11,000,000, or nearly equal to the aggregate dividends paid last year. In maintenance of road the reduction since that time (notwithstanding an increase of 12 per cent. in the mileage of road worked) has been nearly 25 per cent.; in maintenance of equipment, 22 per cent.; in transportation expenses, 9½ per cent.

The payments for interest and dividends taken together were nearly the same as in the previous year, but there was a curious change in the two—a decrease of \$1,600,000 in the dividends and an increase of \$1,360,000 in the interest paid. The dividend payments are nearly 15 per cent. of the total

earnings, and 3½ per cent. on the entire capital stock paid in. If all interest had been paid, however, the total surplus net earnings would have been equivalent to but 2.46 per cent. on the stock.

The average earnings per mile of road were \$10,424; the working expenses, \$6,830; the net earnings, \$3,594; the interest payments, 1,737; the dividends, \$1,550. The percentage of net earnings on the reported cost of the roads was 4.1 per cent. That a large proportion of the interest accruing was not paid may be inferred from the fact that the interest payments were equivalent only to 4.47 per cent. on the whole funded debt, and to but 4 per cent. on the funded and floating debt.

The average receipt per passenger and per ton per mile for ten years has been:

	Passenger.	Ton.
1867-68.....	2.2574 cts.	2.4128 cts.
1868-69.....	2.3901 "	2.0857 "
1869-70.....	2.2675 "	1.7016 "
1870-71.....	2.4899 "	1.7005 "
1871-72.....	2.3801 "	1.6645 "
1872-73.....	2.3506 "	1.5997 "
1873-74.....	2.2894 "	1.4476 "
1874-75.....	2.4047 "	1.3039 "
1875-76.....	2.3337 "	1.1604 "
1876-77.....	2.3170 "	1.0590 "

Since 1872-73, passenger rates have fallen 1½ per cent.; freight rates, 33¼ per cent. Compared with the previous year, the rates of 1876-77 were ¾ per cent. less for passengers and nearly 9 per cent. for freight.

Dividends were paid in the latter year by 17 companies, more than half of which have leased their roads and pay dividends from rentals. One company (New York Central & Hudson River) paid 56½ per cent. of the aggregate dividends; and two others, which have very little road in New York, paid 25 per cent.

The lowest receipt per ton per mile reported is 0.88 cent, on the Lake Shore & Michigan Southern; the lowest expense is 0.57 cent, on the Buffalo, New York & Philadelphia, the Lake Shore following with 0.59 cent.

The results in the state of New York depend very largely on the condition of the through traffic between the East and the West, as its report includes not only the two great trunk lines that are within its borders, but also the Lake Shore & Michigan Southern, the Atlantic & Great Western and the Boston & Albany—all great carriers of through traffic, but with only a few miles of their road in New York.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

**Geneva & Lyons.**—This road, before reported under the head of *Syracuse, Geneva & Corning*, is 15 miles long, or 2 miles more than our statement.

**Salisbury.**—Extended south by west 2½ miles to Salisbury, Pa., completing the road.

**Pennsylvania.**—The *Port Perry Connection* is completed from Brinton Station, Pa., southwest across the Monongahela River to a connection with the Pittsburgh, Virginia & Charleston track, about 1 mile.

**Waynesburg & Washington.**—Extended through Washington, Pa., to a connection with the Wheeling, Pittsburgh & Baltimore road, 1 mile. It is of 3 ft. gauge.

**East Line & Red River.**—Extended from Pittsburgh, Tex., west to Leesburg, 7 miles. It is of 3 ft. gauge.

**Detroit, Lansing & Northern.**—The *Stanton Branch* is extended from McBride's, Mich., north to Edmore, 6 miles.

**Lake Huron & Southwestern.**—Extended west by south to Camp Watson, Mich., 9 miles. It is of 3 ft. gauge.

**Indianapolis, Delphi & Chicago.**—Extended from Bradford, Ind., southeast to Monticello, 9 miles. It is of 3 ft. gauge.

**Dayton, Sheridan & Grande Ronde.**—The first track is laid from Dayton, Yamhill County, Oregon, southwest 6 miles. It is of 3 ft. gauge.

**Olympia.**—Completed from Olympia, Wash. Ter., southeast to Tenino, 15 miles. It is of 3 ft. gauge.

This is a total of 58½ miles of new railroad, making 1,005 miles completed in the United States in 1878, against 943 miles reported for the corresponding period in 1877, 1,231 in 1876, 607 in 1875, 916 in 1874, 2,028 in 1873, and 3,485 in 1872.

EXHIBITION TRAVEL, of course, makes a most important addition to the passenger traffic of many European railroads this year, and necessitates special arrangements and rates to accommodate it. Aside from the French railroads, probably there are none which profit so much by this traffic as the lines between London and the Channel, of which there are three which have most of the traffic. Our readers will be interested in some of the statements made by a circular of one of these lines—the London, Brighton & South Coast—whose Paris route is made up of its road from London to Newhaven, 57 miles, a steamer passage from Newhaven to Dieppe, about 70 miles, and the railroad line of the Western of France from Dieppe to Paris, 125 miles—altogether 252 miles, of which 182 is by rail—something like a journey from Boston to Philadelphia by a Sound steamer and connecting railroads. Strangely enough, the circular does not give the time of fixed regular trains, but the time of "tidal" trains is given as varying from 11 hours 50 minutes to 14 hours 20 minutes, six to seven hours usually being allowed for the Channel passage. The rates announced for the fixed night and day services are \$8.03 (33 shillings) for a single first-class passage, \$5.84 for second-class, and \$4.14 for third-class. For tickets to go and return, good for one month, the prices are \$13.39 for first-class, \$9.49 for second-class, and \$7.30 for third-class. If the passenger wants a ticket good for two months, he must pay \$1.34 more for a first-class, 95 cents more for a second-class, and 73 cents more for a third-class passage,



The third-class tickets are sold only for the night service. These tickets do not include state-rooms on the steamers. Among the attractions advertised are through conductors and interpreters over both roads and the steamers; the right to break the journey at Brighton, Newhaven, Dieppe or Rouen; no steward's fees on the boats; 66 lbs. baggage allowed; "private deck cabins" (American "state-rooms") at \$2.70 to \$7.30 each; a Pullman car on the English road; the Westinghouse brake on both the English and the French roads, and "communication between passenger and guard."

Besides these daily regular trains and rates, "cheap trains" were announced for every Saturday and Monday of June and "until further notice," leaving London at 10 p. m. By these, round-trip tickets were sold at \$8.76 for first-class, \$5.84 for second-class, and \$5.11 for third-class passage, good for 14 days. Also "special cheap fares for artisans" are announced. Parties of not less than ten, employees of a single firm, are taken third-class to Paris and back for \$4.87, tickets good for 14 days.

THE NORTHWESTERN SPRING WHEAT CROP has been investigated very thoroughly, and conclusions as to its amount drawn from the estimates made by observers in more than 250 counties of the chief spring wheat-growing states, published in the *Chicago Commercial Bulletin*, give a yield of 122,000,000 bushels this year against 128,500,000 last year, the average quality being much poorer this year. That in spite of the great damage to the crop, which extended over a very large part of the districts which raise most spring wheat, there should be a reduction of only 5 per cent. in the yield is accounted for by the fact reported by the same statistics, that the acreage sown was nearly 35 per cent. greater this year, so that with a reduction from 17.93 to 12.25 bushels in the average yield per acre, or nearly one-third, the product is decreased only by the trifling amount mentioned. If only the same area had been sown this year as last, there would have been nearly 43,000,000 bushels less produced, and the injury to the farmers, the carriers and the country would have been vastly greater than it actually is.

To indicate where the falling off has been greatest, and so give some clue to the roads which are likely to be most affected, we copy below the *Bulletin's* figures for the product, in bushels, of the several states for the two years:

	1878.	1877.
Illinois.....	3,925,610	3,063,487
Wisconsin.....	20,694,386	24,138,000
Minnesota.....	25,271,392	37,789,500
Iowa.....	40,665,354	42,159,000
Nebraska.....	15,580,980	9,865,593
Kansas.....	5,514,050	3,475,313
Missouri.....	665,440	227,000
Dakota.....	8,502,370	6,921,000
Colorado and Utah.....	1,227,700	900,000
Total.....	121,947,882	128,536,893

It appears from this that the Minnesota crop is about a third less than last year's, in spite of an increase of 22½ per cent. in acreage, and that there is a decrease of nearly 15 per cent. in Wisconsin; but in Iowa, the leading wheat state (though there the corn crop is more important) there is a loss of but 5 per cent., while in Illinois, Nebraska, Kansas and Dakota there are increases, amounting to nearly 60 per cent. in Nebraska and Kansas.

THE ADVANCE IN WATER RATES continues, and has been greater in lake rates this week than before. Monday the rates telegraphed from Chicago for corn were 8½ cents bid and 4 cents asked; the rates the previous Tuesday (the last reported by us) having been 2¼ for corn and 2¾ for wheat. Tuesday of this week the rates reported as received are 4 cents for corn and 4¼ to 4½ for wheat from Chicago to Buffalo. This is an advance of 167 per cent. within a month, and it doubtless makes the business profitable. The cause is doubtless the increased grain shipments, which are extraordinary for the season, but are not largely of wheat, at least not from Lake Michigan ports, and it is questionable whether the lake shipments will continue unusually large, as there is not likely to be that early and heavy marketing of spring wheat which made the business so large last year, and the heavy shipments of winter wheat will not go largely from Lake Michigan ports. The latter grain, however, is now making a considerable demand for vessels at Detroit and Toledo, from which the distance to Buffalo, however, is only about one-quarter of that from Chicago.

Canal rates have also advanced, 5½ cents a bushel for wheat, 5 for corn and 3½ to 3¾ for oats being reported Tuesday of this week, which is ¼ cent higher all around than on the Wednesday before. Rail rates from Buffalo have also been advanced, and are now 6 cents for wheat, 5½ for corn and 4 for oats, or half a cent more than the canal rates. These rail rates are about equivalent to a through rate of 22 cents per 100 lbs. from Chicago to New York.

Ocean rates on grain are little changed. For Liverpool 7d. per bushel by sail, and 7½d. by steam, were quoted Tuesday.

THE DANGEROUSNESS OF HORSE RAILROADS is not usually considered. Steam railroads have been likened to war and pestilence, but your easy-going and unobtrusive street car is counted perfectly safe. But by the last report of the State Engineer and Surveyor, it seems that the horse railroads are considerably the more dangerous of the two. Counting the average passenger journey on a street car as two miles (and it certainly was not more than that), one passenger was killed for every 121,018,108 miles traveled, and one killed or injured for every 8,346,076 miles on the horse roads, while on the steam roads 147,054,019 miles were traveled to one killed, and 18,715,966 to one

killed or injured. If you wish to be safe, put not your trust in horses, but get behind a locomotive. There was absolutely, in the year covered by the report, a larger number of passengers injured on the horse railroads than on the steam roads (54 to 48), but the killed were seven on steam to four on horse roads, the aggregate distance traveled by steam being (estimating two miles as the average horse-car journey) something more than twice as great as that traveled by horse roads. This refers to passengers alone; the employees and others killed and injured by steam roads greatly outnumber those on the street roads. But the steam roads have a mileage of freight trains four-fifths greater than their passenger-train mileage, for which there is nothing corresponding on the street roads, to say nothing of number of vehicles, etc.

It will probably astonish most readers to learn that the passenger mileage on the 451 miles of street railroads was anything like half as great as on the 8,131 miles of steam railroads worked during the year. Yet it was nearly, providing that this estimate of two miles for the average journey is not too much, and the average passenger traffic per mile of road was eight times as great on the horse as on the steam roads (1,073,229 passenger miles to 126,599).

THE SARATOGA CONFERENCE is in session as we go to press, and the only action yet reported is a unanimous resolution in favor of abolishing the payment of ticket commissions and a recommendation to withdraw outside ticket offices as a source of great expense, an occasion often of conflicts and reductions of rates, without increasing in any degree the aggregate amount of passenger business. A committee is now considering the disposition of live-stock business, and a motion for a distribution of east-bound traffic generally has been referred for consideration. The action with regard to commissions is in the form of a recommendation, as its feasibility will depend upon the unanimity with which it is adopted. Enough roads are represented, however, to make it possible to take this step with regard to a very large amount of business. And there is so general and so decided a disposition to adopt every reform tending to reduce expenses and prevent cutting rates that more is to be hoped from this conference than from most that have preceded it. The companies which have been least inclined to enter combinations heretofore and have been charged with negligence in maintaining them now seem to be foremost in proposing one. The result of this conference, and of proceedings that may follow it, will be looked for with great interest—with a fearful interest by many, doubtless, as one of its most prominent results is likely to be the dismissal of a considerable number of the employees of railroads, who, by a reformed method of doing business, will become unnecessary.

DULUTH, when the line between it and St. Paul was under construction and the Northern Pacific begun, was supposed to be sure of a great and rapid growth, and the belief really seemed to rest on strong grounds. It was two hundred miles nearer a large part of the Minnesota wheat fields than Milwaukee or Chicago, and no more distant from Buffalo than those Lake Michigan cities. But for some reason the grain does not readily go that way. In spite of enormous shipments from Minnesota, there has been usually not much more than the equivalent of 3,000,000 bushels in flour and wheat together received at Duluth in a single year. The report of the St. Paul & Duluth Railroad for the eleven months ending with May last, when the Minnesota wheat shipments were extraordinary, show that it carried 1,384,833 bushels of wheat and 322,910 barrels of flour, equivalent to just about 3,000,000 bushels of wheat in all. Besides this there were the deliveries made by the Northern Pacific; but the latter road since the completion of the line from Brainerd to St. Paul delivers its wheat largely at St. Paul or Minneapolis, though the distance is greater than to Duluth, and St. Paul is 325 miles from Milwaukee and 410 from Chicago. The total exports of Minnesota from last year's crop are estimated at something like 25,000,000 bushels, so that Duluth seems to have secured but a small share of it. As cultivation increases on the Northern Pacific, it will be likely to get more. But the five or six years of the history of the place so far indicate that it will be extremely difficult to interrupt the long-established current of traffic to Lake Michigan.

"WAITING FOR THE TIDE" is common enough for ships the world over, we suppose, but it seems a little odd here that railroad trains should be governed by them. But in England (and in France, too, doubtless) "tidal trains" are a regular institution. The Channel steamers take advantage of the tide, and trains run to connect with them, so varying from day to day in their times of leaving and arriving. An advertisement before us announces that the "special day express, tidal service, London to Paris," by way of Newhaven and Dieppe, will leave London Bridge as follows: June 1, 11:40 a. m.; June 3, 5:40 a. m.; June 4, 7:35 a. m.; June 5, 7:35 a. m.; June 6, 8:55 a. m.; June 7, 9:35 a. m.; June 8, 10:50 a. m.; June 10, 1:05 p. m., and so on, at the sweet will of the moon. Moreover, it is announced that "To suit the tides it may be sometimes necessary for the boat to leave earlier than the advertised time; it is therefore necessary for the passengers to be on board the steamers at least 15 minutes before the advertised sailing, to ensure their not being left behind;" which makes one wonder why the "advertised time" is not put 15 minutes earlier, to conform to the facts, it being generally less harmful for a public carrier to start behind than ahead of time.

CONEY ISLAND has been the efficient cause of several new railroads within the past three years, and of a vast number of projects—as instance the following titles of new railroad companies organized under the general railroad law

during the twelve months ending with September last: Brooklyn & Coney Island Central; Brooklyn, Flatbush & Coney Island (now completed); Coney Island Beach; Coney Island High & Low Water Mark; Coney Island Surf; Marginal Railroad; Midwout, Amersford & Coney Island; New York & Manhattan Beach (completed); Ocean Palace Elevated; Sheephead Bay & Coney Island;—a total of ten companies, which proposed to build no less than 67 miles of railroad to or on the little stretch of sand where the surf comes in so finely and which was already connected with New York and Brooklyn by two railroads and one or two steamboats hourly.

It must be confessed, however, that the new railroads that have been built have secured a very large business, though partly at the expense of the old ones and the steamboats. Of the new projects some four or five were for roads around the island or along part of its margin. The whole number of organizations in the state under the general law that year was 34, and that ten of them were for roads in this very little corner of it seems remarkable.

A "RAILWAY CONFERENCE" has been ordered by the Government of India, to which officers of the railroads owned or guaranteed by the government (that is nearly all of them) and "delegates from public bodies" are invited. At this conference subjects are to be discussed which "relate to the economic and efficient workings of railways, as respects both the public using the railways and the employees with whose aid they are worked." Apparently, any one is free to present papers or suggestions, which will come through the hands of certain officers of the railroads to the Public Works Department, which will then probably make up the programme for the conference. The order now issued by the government leaves everything very indefinite, not even fixing the time of meeting.

#### Report of the Michigan Railroad Commissioner for the Year 1877.

The following are selections from the interesting report of W. B. Williams, Commissioner of Railroad of Michigan, for the year 1877, which has just been issued, much earlier than usual:

The report last year did not get through the press until early in October, a delay caused by the neglect of the railroad corporations to forward the annual statements to this office. This year I have had no cause of serious complaint in that regard, and in consequence of the promptness with which the companies have forwarded their returns, have been enabled to get the report ready for distribution at a much earlier date than heretofore.

#### REPORTS.

The returns from the railroad companies were not only forwarded to this office with greater promptness than heretofore, but were far more complete in detail, a comparatively small number requiring to be sent back for correction, and these only in some minor regard. This result is the more gratifying in consequence of the fact that the form for the returns sent out required a more full and complete showing, and the requirements have been fairly met by the companies.

In the organization of this office it was deemed wise by the Legislature of this State to inaugurate a system that would furnish full and complete information to the law-making power in regard to the actual condition of the railroads before attempting to make any material change in the laws regulating rates of passenger and freight traffic. About the time Michigan adopted its present system of obtaining information, other States entered upon a detailed system of legislative control of rates. This was notably so in Illinois, Wisconsin and Iowa. It was a blind effort on the part of legislation to pander to a popular demand without the requisite information; and while the laws thus enacted were pronounced constitutional by the highest judicial tribunal in the land, their wisdom was never affirmed.

Our State has, from the outset, adhered firmly to the doctrine of legislative control of railroads, but it has endeavored to exercise that control wisely, so as to promote the interests of both the carrier and the shipper, and the result has been that at no time has public clamor or popular indignation been raised against railroad corporations; and hence when our sister States were enacting laws to control railroads and to regulate the entire tariff of freight and passenger business by law, without first obtaining the information requisite for the wise and proper enactment of laws, Michigan provided a system of reports that would enable its Legislature to determine in advance the wisdom of the proposed enactment.

Deeming one of the important objects to be reached by this office to be the cost of movement of freight and of passengers, independent of all other sources of expense, I prepared the blanks this year so as to show as near as practicable the expense of movement of trains, and to obtain such information, divided the operating expenses into four classes, viz:

- 1st. Maintenance of way and buildings;
- 2d. Maintenance of motive power and cars;
- 3d. Conducting transportation; and
- 4th. General expenses;

The last item covering the entire expense of management of the corporate property of the several corporations, including the salaries of all the general officers, taxes, and all other general expenses, and is embraced in "Table V., Operating Expenses."

From this table it appears that the general expense account amounts to the sum of \$2,636,806.89, being 10.58 per cent. of the entire expense of operation. The salaries of all the general officers of these corporations, including the Lake Shore & Michigan Southern, with its 1,176 miles of railroad, 403 miles of which is in this state, and the Chicago & Northwestern, with its 1,615 miles of road, of which 196 miles are in this state, amounts to the aggregate sum of \$333,258.84, or 1.34 per cent. of the entire operating expenses.

#### ACCOUNTS.

The value of any system of reports depends upon the correctness of the accounts from which they purport to be made; if the reports are made up largely from estimates, and not from a complete statement of accounts to be found upon the books of the companies, they can be of but little practical value. It therefore becomes important, if we are to have authentic reports, that the accounts should be authentic from which they are compiled, and if we are to have a uniform system of reports, there should also be, as the basis for it, a uniform system of accounts in so far as necessary to furnish the required information.



As many of our railroads in this State are parts of continuous lines passing into and through other States, a system of accounts to be of practical value should be the same in each of the States into or through which a continuous line of road may pass. In order to reach such a system, the cooperation of the several States interested will be necessary; in other words, a uniform system of accounts in the several States, and a uniform system of reports, can only be obtained by the action of each of these States, and probably by the enactment of laws of a similar purport in each. How much of the detail of bookkeeping should be embodied in such law is a question upon which I am not prepared to express an opinion; but in such legislation, as in all other statute regulation of business, no more legal requirements should be made than are necessary to protect the rights of the public, and of the bond and stockholders of these corporations.

The time has evidently arrived when wise and judicious legislation in this regard would meet with the cordial approval and support of our best and most efficient railroad managers and most thorough accountants. The system of accounts kept by some of the roads reporting to this office is to-day, probably, as complete as any that can be devised; and if such a system could be adopted by all the corporations, it would preserve a healthy check upon railroad business now wanting, and prevent the guerilla warfare that has been carried on between railroads for the last few years to the great detriment, in fact, bankruptcy, of many of our corporations, and also to the serious injury of the shipping and producing interests.

A stable and well-defined rate of freight tariff is as essential to the producer and shipper as a uniform value in the currency. The farmer ought to be able to know, with reasonable certainty, the cost of placing his products in the seaport markets. The dealer in these products ought also to be able to purchase with reasonable knowledge of the cost of delivering the same in market; but under the system adopted for the last few years, this cost has been in a great degree speculative, brought about by combinations and agreements between the freight agents and managers of the trunk lines to increase and regulate rates to-day, to be broken to-morrow, under one and another pretense, frequently and usually that some of the roads that entered into the combination have "cut under" and not adhered to the arrangement.

Almost any system of management would be better than the present and past. A stable and reasonable rate would be far better for the public, and if a uniform system of accounts should be kept, a reasonable rate could be readily arrived at and the interests of all protected. If such accounts were kept open to public inspection the cutting process could be readily detected, and much of the jealousy that now exists would be removed. This, it is true, might have a tendency to impair the beneficial effects of a healthy competition, but if the rates should be made unreasonable and oppressive, the law-making power could intervene to prevent it and apply the corrective.

It is getting to be a serious question, whether the law of competition will long be of any value, or whether there will be any competition between our trunk lines in the carrying trade. The two leading trunk lines of this state that have heretofore permeated nearly all portions of Southern Michigan by their main and branch lines, and at all times maintained a healthy competition for the carrying trade, are now under one control, and competition no longer exists between them. We have, by legislative enactment and constitutional amendment, prohibited the consolidation of parallel and competing lines of railroads; but we cannot by constitutional enactment or legal restraint prevent one individual from owning them all, and the only remedy in such case must be found in legislation; and while I do not think that any other than a wise and conservative course will be adopted by the present general management of the Michigan Central and Lake Shore & Michigan Southern corporations, and believe that no oppressive or arbitrary rates will be established, still the fact that such immense power may be acquired by one person, or by any combination of individuals, teaches the necessity for other control than that furnished by competition, and the necessity that may exist for wise and judicious legislation in regard to rates. As such legislation must rest upon correct information, to be furnished from the accounts of the corporations themselves, and as such corporations are the creations of the statute laws of several States, and within each of such States subject to legislative control, the necessity for a uniform system of accounts and reports among the several States becomes the more apparent, in order that a uniform system of legislation in each of the States may be adopted.

I have no question in regard to the power of the national government to act under the authority given to regulate commerce among the several States; but until it shall have acted, the power and responsibility must rest with the States.

Action looking toward such a system of accounts has been taken by the commissioners of the States of Ohio, Indiana, Illinois, Wisconsin, Minnesota, and the Secretary of State of Iowa, in a petition addressed to the legislatures of the States of Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa and Missouri, recommending "a form of returns and rules under which accounts in future are to be kept." I did not join in the petition, as I was not convinced that the form prescribed was the best that might be adopted, and preferred to have a meeting for the purpose of consultation before committing myself to any plan, and also in order that the plan that should be adopted might be as much as practicable in harmony with the system of accounts now in use by our best railroad accountants. I thought it desirable to wait the action of a meeting of railroad commissioners that might be called for the purpose of such consultation, trusting that at such meeting we might be favored with the views of such accountants. The initiative has already been taken by the boards of Missouri and Illinois, and a meeting called for consultation on the 12th of November at Columbus, Ohio, at which time I trust that the auditors of the principal roads will be invited to meet with us.

After such meeting I shall take the liberty to submit to you such suggestions as may be agreed upon by the several boards and commissioners there assembled.

While, taken collectively, our roads were comparatively successful in their operations during 1877, we find a larger number than ever before, of roads whose earnings did not equal the expense of their operation, as is shown by the following table:

ROADS.	Operating expenses above earnings.
Chicago & Canada Southern.....	\$21,964.63
Chicago & Lake Huron.....	208,097.01
Detroit, Hillsdale & Southwestern.....	112.45
Glencoe, Pinconning & Lake Shore.....	581.54
Hecia & Torch Lake.....	6,145.70
Mansfield, Coldwater and Lake Michigan.....	7.91
Michigan Air Line R. R.....	255,812.78
Michigan Midland & Canada.....	820.68
Toledo, Canada Southern & Detroit.....	96,184.98
Total.....	\$580,727.60

## INTEREST AND RENTAL.

The interest and rental liability of our roads for the year amounted to \$12,351,908.64, a decrease from the previous year of \$479,285.95, or three and eleven-hundredths per cent. Of this total liability \$9,689,104.43 was discharged, and \$2,652,804.21 remained a charge against the defaulting companies.

The interest and rental average, per mile of road, amounted to \$2,135.30, a decrease of \$119.70 from that of the previous year.

This class of demands against the companies was equal to 31.23 per cent. of the earnings.

Eight roads report no part of their interest paid, an aggregate of entire default of \$962,107.50; a sum larger by \$99,253.00 than appeared under the same head for the previous year:

ROADS.	Amount of interest.
Chicago & Canada Southern.....	\$179,480.00
Chicago & Lake Huron.....	429,800.00
Chicago, Saginaw & Canada.....	12,950.00
Detroit & Bay City.....	186,400.00
Glencoe, Pinconning & Lake Shore.....	8,000.00
Michigan Midland & Canada.....	22,540.00
Toledo, Canada Southern & Detroit.....	105,000.00
Traverse City.....	17,937.50
Total.....	\$962,107.50

Nine roads were able to pay a portion of their interest—the amounts unpaid being as given below, and aggregating a total of \$1,674,736.71; a partial default less by \$602,288.64 than for the year previous:

ROADS.	Interest unpaid.
Chicago & Michigan Lake Shore.....	\$494,320.00
Detroit & Milwaukee.....	345,716.78
Detroit, Hillsdale & Southwestern.....	590.00
Detroit, Lansing & Northern.....	98,858.33
Flint & Pere Marquette.....	251,905.60
Fort Wayne, Jackson & Saginaw.....	85,000.00
Marquette, Houghton & Ontonagon.....	300,776.00
Saginaw Valley & St. Louis.....	17,300.00
Total.....	\$1,674,736.71

## MICHIGAN RAILROADS.

Comparative summary from returns of 1874, 1875, 1876 and 1877, prepared by the Commissioner of Railroads for his Report for 1877.

	1874.	1875.	1876.	1877.
Total length of railroads and branches.....	Miles. 5,278.36	Miles. 5,311.77	Miles. 5,387.25	Miles. 5,436.28
" " " in Michigan.....	3,314.98	3,346.21	3,410.67	3,455.20
" " double track.....	304.55	303.30	308.15	308.15
" " sidings.....	898.89	910.10	1,145.02	1,147.00
Capital stock paid, in.....	\$138,850,373.61	\$141,100,267.04	\$142,633,233.44	\$145,527,601.70
Total funded debt.....	26,713.22	27,046.84	27,875.44	28,371.11
" unfunded debt.....	156,468,893.46	149,435,583.40	150,594,000.04	149,072,124.03
Total debt.....	8,573,670.08	11,992,249.52	13,952,038.12	17,290,297.92
Total stock and debt.....	295,319,237.07	161,427,832.92	164,546,118.76	167,271,421.65
" per mile of road.....	30,128.56	30,945.28	32,068.37	32,610.13
Total stock and debt.....	225,124,608.30	302,528,100.56	306,579,352.20	312,799,083.41
" per mile of road.....	56,892.77	57,092.12	59,943.81	60,081.24
Total cost of roads and equipment.....	282,106,775.36	284,954,630.70	287,035,838.27	292,086,830.13
" per mile.....	54,453.91	54,921.65	55,176.34	57,002.25
Proportion of cost for Michigan.....	151,080,077.24	154,532,065.72	155,114,549.20	158,463,713.43
Earnings:				
From passengers.....	\$12,537,230.74	\$11,590,804.06	\$11,263,942.94	\$10,255,365.36
" mails.....	1,093,484.54	945,420.00	1,074,785.42	974,063.79
" express.....	850,374.83	784,353.93	759,724.92	715,656.49
" freight.....	31,071,591.01	27,353,727.33	26,045,792.20	27,290,290.30
" other sources.....	346,218.52	410,882.62	330,014.40	374,014.12
Total earnings.....	\$45,898,890.64	\$41,085,220.54	\$40,383,219.88	\$39,545,030.06
Earnings per mile of road.....	\$8,170.94	\$7,229.50	\$7,094.39	\$6,830.85
" per train mile—passenger trains.....	1.59	1.437	1.415	1.348
" per train mile—freight trains.....	1.71	1.656	1.52	1.551
" per train mile—all trains.....	1.65	1.534	1.484	1.487
Earnings above operating expenses.....	\$15,356,040.61	\$11,099,599.30	\$13,698,116.63	\$13,944,077.02
Receipts in addition to earnings.....		\$200,205.47	\$241,780.95	\$206,971.34
Total receipts for the year.....	\$45,898,890.64	\$41,285,426.01	\$40,625,000.83	\$39,752,001.40
Expenses:				
Maintenance of way and buildings.....	\$7,255,110.10	\$7,493,898.64	\$6,151,526.80	
Motive power and cars.....	5,600,700.12	4,718,559.66	4,262,533.65	
General traffic.....	17,559,802.55	17,166,644.25	16,271,042.80	
Expenses:				
Maintenance of way and buildings.....				\$6,630,173.34
Motive power and cars.....				3,653,741.25
Conducting transportation.....				12,080,033.79
General expenses.....				2,636,806.89
Total operating expenses.....	\$30,543,249.13	\$29,385,621.15	\$26,685,103.25	\$25,001,853.04
Operating expenses per mile of road.....	\$5,442.52	\$5,170.91	\$4,987.88	\$4,421.72
" per train mile.....	1.10	1.09	0.95	0.90
" per cent. of earnings.....	66.54	71.28	66.07	64.74
Interest and rental—total.....	\$12,134,463.00	\$12,537,078.92	\$12,831,194.56	\$12,351,908.64
" per mile of road.....	2,186.13	2,210.35	2,255.00	2,135.30
" per train mile.....	43 cts.	40 cts.	46.02 cts.	46.30 cts.
" per cent. of earnings.....	26.43	30.51	31.78	31.23
Operating expenses, interest and rental—total.....	\$42,677,712.22	\$41,922,700.07	\$39,516,297.84	\$37,953,761.68
Operating expenses, interest and rental—per mile of road.....	7,628.65	\$7,381.26	\$6,942.88	\$6,557.02
" per train mile.....	1.53 cts.	1.50 cts.	1.4173 cts.	1.4238 cts.
" per cent. of earnings.....	93.07	101.70	97.80	95.97
Net Deficit:				
Operating expenses, interest and rental—above earnings.....		\$837,479.53		
" per mile of road.....		151.70		
Operating expenses, interest and rental—above earnings—per train mile.....		.11		
Operating expenses, interest and rental—above total income.....		637,274.06		
Net Earnings:				
Earnings above operating expenses, interest and rental.....	\$3,221,187.42		\$800,922.04	\$1,502,168.38
Earnings above operating expenses, interest and rental—per mile of road.....	551.29		151.51	273.83
Earnings above operating expenses, interest and rental—per train mile.....	11 cts.		03.11 cts.	6.32 cts.
Total Net Receipts—Total receipts above operating expenses, interest and rental.....	\$3,221,187.42		\$1,108,711.91	\$1,709,130.72
Average rate per ton per mile.....	1.37 cts.	1.30 cts.	0.982 cts.	1.032 cts.

The deficit shown in the above table in the case of the Michigan Lake Shore is the entire interest on the funded debt of the road—the portion of interest which was paid by the Receiver, being that which accrued during the year on the issue of Receiver's certificates, and amounted to \$12,525.33.

The operating expenses, interest and rental of the following named roads exceeded their gross receipts by the several amounts named, which aggregate a total deficit of \$2,729,297.61, an amount less than the deficits for the previous year by \$989,650.04:

ROADS.	Excess of operating expenses, interest, and rental over income.
Chicago & Canada Southern.....	\$201,444.63
Chicago & Lake Huron.....	637,807.01
Chicago & Michigan Lake Shore.....	449,492.26
Chicago, Detroit & Canada Gr. Trunk Junction.....	76,390.42
Chicago, Saginaw & Canada.....	10,882.95
Detroit & Bay City.....	89,115.13
Detroit & Milwaukee.....	208,841.21
Detroit, Hillsdale & Southwestern.....	1,354.70
Flint & Pere Marquette.....	220,088.18
Fort Wayne, Jackson & Saginaw.....	84,951.03
Glencoe, Pinconning & Lake Shore.....	8,581.54
Grand Rapids & Indiana.....	248,455.63
Grand Rapids, Newaygo & Lake Shore.....	5,627.74
Hecia & Torch Lake.....	6,145.70
Mansfield, Coldwater & Lake Michigan.....	15,067.91
Marquette, Houghton & Ontonagon.....	106,530.26
Michigan Lake Shore.....	68,542.91
Michigan Midland & Canada.....	23,300.08
Toledo, Canada Southern & Detroit.....	201,184.98
Total.....	\$2,729,297.61

It should be noted that the deficit in the above table against the Detroit, Lansing & Northern Railroad is only one of accounts; this interest not being due until Jan. 1, 1878, it was not included in the interest paid, although paid when due, from the earnings of the year.

## OPERATING EXPENSES, INTEREST AND RENTAL COMPARED WITH GROSS RECEIPTS.

The operating expenses, interest and rental accounts combined, amounted for the year to \$37,953,761.68, a sum less than the aggregate of these accounts for the previous year by \$2,562,536.16, or three and ninety-five hundredths per cent. These combined expenses make an average of \$6.



557.02 per mile of road, and are equal to ninety-five and ninety-seven hundredths per cent. of the earnings.

#### NET INCOME.

The results of the year's business shows a total income from all sources of \$39,752,901.40, and a total expenditure for operation and interest of \$37,953,761.68, which leaves as the net income for the year \$1,799,139.72, a gain of \$690,427.73, or more than 62 per cent., over the previous year. This net income is equal to \$350.75 per mile of road owned, and \$306.26 per mile of road operated.

#### EARNINGS AND EXPENSES PER TRAIN MILE.

The earnings per train mile run, were, for passenger trains, \$134.8 a decrease from the previous year of 6.7 cents; for freight trains \$1.551, an increase of 3.1 cents; and for all trains earning revenue \$1.487, an increase of 3.86 cents.

The operating expenses per train mile earning revenue were \$0.9602, an increase of one cent over the previous year.

The classified expenses per train mile were, for maintenance of way and buildings, 23.63 cents; for maintenance of motive power and cars, 13.62 cents; for conducting transportation, 48.61 cents, and for general expenses, 10.16 cents.

The interest and rental expense per train mile earning revenue was \$0.4636, an increase for the year of 0.34 cent.

From these items it will be seen that the total operating interest and rental per train mile amounted to \$1.4238, an increase from the previous year of 0.65 cent, but yet leaving as the net profit, 3.21 cents per train mile.

#### DIVIDENDS.

Four companies paid dividends as a result of the year's business as follows:

Chicago & Northwestern, one of 3/4 per cent. on preferred stock, amounting to.....	\$753,379.47
Lake Shore & Michigan Southern, one of 10 per cent. on guaranteed stock, amounting to.....	53,350.00
And one of 2 per cent. on common stock; amounting to.....	989,330.00
Michigan Air Line Railway, one of 1.28 per cent. on common stock, amounting to.....	3,849.73
Mineral Range, one of 5 per cent. on stock, amounting to.....	11,640.00
Total.....	\$1,811,549.20

### General Railroad News.

#### MEETINGS AND ANNOUNCEMENTS.

##### Dividends.

Dividends have been declared as follows:  
Chicago & Alton, 3/4 per cent., semi-annual, payable Sept. 4. Transfer books close Aug. 20.  
Chicago, Burlington & Quincy, 4 per cent., semi-annual, payable Sept. 16.

##### Railroad Conventions.

The *Traveling Passenger and Advertising Agents' Association* will hold its sixth annual convention at the Gibson House, Cincinnati, beginning Sept. 4, at noon.

The *General Ticket and Passenger Agents' Association* will hold its regular semi-annual meeting in Chicago, Sept. 13.

The *General Time Convention* will hold its fall session at the Grand Pacific Hotel, Chicago, Oct. 10.

The *Railroad Claim Agents' Association* will meet at the Planters' Hotel, St. Louis, Oct. 15.

The *Southern Time Convention* will hold its fall session at the Windsor Hotel, New York City, Oct. 17.

##### Foreclosure Sales.

The franchise and right to take tolls of the *Nashua, Acton & Boston* Company in New Hampshire was sold at Nashua, N. H., Aug. 13, to satisfy a judgment for \$33,565 held by John C. Moulton. Bought for a term of 30 years by Mr. Moulton, who is said to have already secured the few miles of the road in Massachusetts. The road extends from Nashua, N. H., to Concord Junction, Mass., 24 miles; it is leased by the Concord Railroad Company. The sale leaves the title to the property in the company, giving Mr. Moulton the right to the receipts for the term of his purchase.

The sale of the *Montclair & Greenwood Lake* road has been postponed from Aug. 17 to Aug. 24, at Jersey City, N. J.

The *New York, West Shore & Chicago* road is to be sold under foreclosure of mortgage in New York, Sept. 27. There is no finished road, the assets outside of the franchise consisting of some right of way, an unfinished tunnel at West Point, N. Y., and the Elysian Fields property at Hoboken, N. J., which is heavily mortgaged to secure purchase money.

##### The Saratoga Conference.

The General meeting of representatives of the through lines began at the United States Hotel, Saratoga, Aug. 20. The representatives of the various lines present were as follows:

New York Central & Hudson River, Wm. H. Vanderbilt, President; Wm. K. Vanderbilt, Vice-President; J. H. Rutter, General Traffic Manager; I. P. Chambers, General Auditor; E. Clark, Jr., General Freight Agent; C. B. Meeker, General Passenger Agent, and J. B. Dutcher, Live Stock Agent.

New York, Lake Erie & Western, Hugh J. Jewett, President, and George R. Blanchard, Assistant to President.

Pennsylvania Railroad, A. J. Cassatt, Vice-President.

Baltimore & Ohio, John King, Jr., Vice-President; M. L. Doherty, General Freight Agent, and C. M. Wicker, Traffic Manager Trans-Ohio Lines.

Grand Trunk, L. J. Seargeant, Traffic Manager; John Porteous, Assistant General Freight Agent; T. A. Howe, General Agent, and William Wainwright, General Passenger Agent.

Boston & Albany, D. W. Lincoln, President, and William Bliss, General Manager.

Fitchburg Railroad, W. B. Stearns, President; C. S. Hartwell, General Freight Agent, and B. McChan, General Agent Hoosac Tunnel Line.

Troy & Boston, D. Robinson, Vice-President.

Central Vermont, G. W. Bentley, General Manager, and Lansing Mills, Superintendent of Traffic.

Pennsylvania Company, J. N. McCullough, Vice-President, and William Stewart, General Freight Agent.

Lake Shore & Michigan Southern, John Newell, General Manager; Addison Hills, General Freight Agent; G. H. Valiant, Assistant-General Freight Agent; F. E. Morse, General Western Passenger Agent, and J. A. Burch, General Eastern Passenger Agent.

Canada Southern, J. Tillinghast, President; W. K. Muir, General Manager; W. H. Perry, General Freight Agent, and F. E. Snow, General Passenger Agent.

Great Western, of Canada, F. Broughton, General Manager, and G. B. Spriggs, General Freight Agent.

Michigan Central, H. B. Ledyard, General Manager; J. A. Greer, General Freight Agent; and H. C. Wentworth, General Passenger Agent.

Atlantic & Great Western, J. H. Devereux, Receiver. Cleveland, Columbus, Cincinnati & Indianapolis, J. H. Devereux, President.

Wabash, J. M. Osborn, General Freight Agent, and H. C. Townsend, General Passenger Agent.

Marietta & Cincinnati, R. M. Fraser, General Freight Agent.

Indianapolis, Cincinnati & Lafayette, M. E. Ingalls, Receiver.

Vandalia Line, J. E. Simpson, General Manager.

Ohio & Mississippi, W. Duncan, General Freight Agent.

Lafayette, Muncie & Bloomington, G. H. Chapman, Receiver, and E. H. Waldron, General Superintendent.

Detroit & Milwaukee, S. P. Callaway, General Superintendent.

Detroit, Lansing & Northern, J. B. Mulliken, General Superintendent.

Flint & Pere Marquette, H. C. Potter, General Manager; D. Edwards, General Freight Agent, and J. P. Nourse, General Passenger Agent.

Chicago & Alton, J. C. McMullin, General Manager.

Chicago, Burlington & Quincy, C. W. Smith, Traffic Manager.

Hannibal & St. Joseph, J. B. Carson, General Manager.

Gen. J. H. Devereux was chosen Chairman, and W. Duncan (Ohio & Mississippi), Secretary.

The question of ticket commissions was first taken up, and a committee was appointed to consider and report on the subject, the members being John King, Jr., Wm. K. Vanderbilt, L. J. Seargeant, C. W. Smith, J. C. McMullin, H. C. Townsend, J. B. Carson, F. Broughton, J. N. McCullough, John Newell, H. B. Ledyard and Wm. Bliss.

The meeting then adjourned to the next (Wednesday) morning.

On the 21st, the committee appointed the previous day on ticket commissions reported the following resolutions:

*Resolved*, That the practice of paying commissions of sale on railroad tickets is demoralizing to employees and useless to the public. It entails enormous loss to companies, and should be discontinued.

*Resolved*, That the best interests of the companies will be served by the abolition of the present system of paying such commissions.

*Resolved*, That it is further recommended that all outside agencies for the sale of tickets be abolished.

*Resolved*, That a circular embodying the above recommendations be sent to all companies, asking for their assent, containing a clause to the effect that it will not be binding on them unless, and until, all competitors have agreed thereto, and asking companies to name such competitors.

The report was unanimous, and the resolutions were adopted without dissent, the committee being continued for the purpose of carrying out the resolutions.

The questions relating to the St. Louis live-stock traffic were then taken up, and, after a short discussion, the question was referred to the Western Executive Committee, consisting of Messrs. Devereux, Simpson, Newell, Hopkins, Ledyard and McMullin.

Mr. Jewett then made a short address in favor of some plan for equalizing east-bound freight and maintaining rates. The question of east-bound freights was then referred to the Western Executive Committee and the Trunk Lines' Executive Committee to report on some arrangement.

The conference then adjourned until the next day. The rest of the day was occupied by committee work and by conferences relating to local business. These included meetings between the Great Western and Canada Southern, the St. Louis lines and the Boston lines. Another is said to have been held between the New York Central and Erie.

Among other business to be considered is a proposition from the Union and Central Pacific for shortening the time for fast freight between Eastern and California points.

#### ELECTIONS AND APPOINTMENTS.

*Belleville & North Hastings*.—At the annual meeting in Belleville, Ont., Aug. 9, M. Bowell, A. Hugel and D'Arcy Boulton were chosen directors. The board reelected M. Bowell, President.

*Cincinnati Southern*.—At the annual meeting of the Common Carrier Company, which leases the completed portion of the road, in Cincinnati, Aug. 14, the old board was reelected as follows: Rufus King, Robert Mitchell, J. H. Rogers, R. M. Shoemaker, Henry Lewis, W. H. Clement, David Sinton, Preserved Smith, Wm. Glenn, J. N. Kinney, Alfred Gaitner, J. L. Keck, J. H. Rhodes.

*Galena & Southern Wisconsin*.—At a special meeting in Galena, Ill., Aug. 13, the following directors were chosen: Wm. Dickson, Darius Hankins, O. S. Horton, M. Y. Johnson, C. R. Perkins. The board elected M. Y. Johnson President. It is said that the old board will refuse to recognize the validity of this election.

*Green Bay & Minnesota*.—Mr. E. C. Belknap has been appointed Train Dispatcher of this company.

*Indianapolis, Bloomington & Western*.—The company organized by some of the bondholders to buy in the road at foreclosure sale has elected officers as follows: President, John W. Kirk, New York; Vice-President, John C. Short, Danville, Ill.; Secretary and Treasurer, Frank Shepard, Greenwich, Conn.; Attorney, James T. Worthington, New York.

*Madison & Portage*.—At a meeting held in Madison, Wis., Aug. 16, Alexander Mitchell, S. S. Merrill, John C. Gault, H. Crocker and John W. Cary were chosen directors in place of Messrs. Campbell, Peck, Atwood, Bullen and Clinton, resigned. The new directors are all connected with the Chicago, Milwaukee & St. Paul, which now owns a controlling interest in the road, which it has worked for some time.

*Marquette, Houghton & Ontonagon*.—Mr. W. C. Rogers, General Freight Agent of this road has resigned the position, dating from Aug. 17, and Mr. A. S. Parks has been appointed as his successor. All communications relating to the freight department will be addressed to Mr. Parks at Marquette, Mich.

*New York Elevated*.—Mr. H. A. Bishop has been chosen Vice-President, in place of Wm. T. Pelton, resigned.

*New York, Sea Beach & Coney Island*.—The directors of this new company are as follows: John W. Bigelow, Alexander McDonald, Charles K. Clark, Edward T. Hunt, W. B. Bigelow, A. Hayward, S. R. Platt, Clinton Wagner, N. H. Davis, W. P. Siegrist, Thomas H. McGrath.

*Portland & Ogdensburg, Vermont Division*.—At the annual meeting in Hyde Park, Vt., Aug. 13, the following directors were chosen: Franklin Fairbanks, St. Johnsbury, Vt.; James D. Bell, Walden, Vt.; John A. George, Hardwick, Vt.; Oliff Abell, Wolcott, Vt.; George W. Hendee, Morrisville, Vt.; Waldo Brigham, Hyde Park, Vt.; Orange Buck, Johnson, Vt.; R. S. Reed, Fairfield, Vt.; D. D. Weed, Shelton, Vt.; O. S. Rixford, Highgate, Vt.; Henry A. Burt, Swanton, Vt. Mr. Burt succeeds A. B. Jewett, now one of the Receivers of the road. The board elected Waldo Brigham President; Franklin Fairbanks, Vice-President; John A. George, Secretary; D. D. Weed, Treasurer.

ham President; Franklin Fairbanks, Vice-President; John A. George, Secretary; D. D. Weed, Treasurer.

*Profile & Franconia Notch*.—This company has been organized under a charter granted by the New Hampshire Legislature with the following officers: President, Richard Taft; Clerk and Treasurer, C. H. Greenleaf.

#### PERSONAL.

—Mr. Samuel Andrews, one of the chief owners or partners in the Standard Oil Company, has retired, having sold his interest to his partners, receiving, it is said, nearly \$1,000,000. Mr. Andrews had charge of the refining interests at Cleveland.

—Ex-Gov. C. C. Carpenter, of Fort Dodge, Chairman of the Iowa Board of Railroad Commissioners, has been nominated for representative in Congress by the Republicans of the Ninth Iowa District. A Republican nomination in that district is usually equivalent to an election.

—Mr. William Young died at the residence of his brother, Joseph Young, in Chicago, Aug. 13. He was well known as a railroad contractor, who had done work on many western lines. His last large contract was on the Michigan Air Line, which he built and chiefly owned until a few months since.

—Capt. Wm. S. Nelson, a mechanical engineer and contractor, died at his residence in St. Louis, Aug. 13. He had just returned from Fort Eads, La., where he was employed on the Mississippi jetties, and is said to have died of yellow fever. He had charge of the building of the caissons for the St. Louis bridge.

—Mr. Alexander H. Tilton, a prominent manufacturer, and for many years a director and large stockholder in the Boston, Concord & Montreal Company, died Aug. 16, at his residence in Tilton, N. H., aged 70 years.

—The Greenback party has nominated Bradley Barlow as its candidate for Representative in Congress from the Third Vermont District. Mr. Barlow is a director of the Central Vermont and the Vermont & Canada, President of the Southeastern, of Canada, and a large mail contractor, owning many stage routes in the West and Southwest. He was formerly an active opponent of the Smith ring in Vermont, but went over to that side some years ago.

—Charles W. Angell, Secretary of the Pullman Palace Car Company, has disappeared, taking with him money and securities to the amount of about \$120,000. He had been Secretary since the organization of the company, 11 years ago, and great confidence was reposed in him, which made it easy for him to carry off a considerable amount in cash. He left Chicago about July 17, stating that he would take a short vacation, as he usually did in summer, and would probably meet Mr. Pullman in New York early in August and return to Chicago with him. Nothing has been seen of him since he left Chicago, and it is thought that he went directly to Europe. His defalcation was not suspected until he failed to return at the appointed time.

—The magnificent house built a few years ago by Mr. S. D. Karns, President of the Parker & Karns City and Karns City & Butler companies, near Freeport, Pa., was sold recently at Sheriff's sale for \$10,015. It is said to have cost Mr. Karns nearly \$100,000.

—Hon. Wm. A. Bird, an old citizen of Buffalo, N. Y., who died in that city Aug. 19, aged 81 years, was in 1836 the principal agent in the construction of the Buffalo & Niagara Falls road, and was its Superintendent for a number of years.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings for various periods are reported as follows:

Seven months ending July 31:

	1878.	1877.	Inc. or Dec.	P. c.
Cairo & St. Louis.....	\$121,716	\$138,882	D.	\$17,166 12.4
Clev., Mt. Vernon & Delaware.....	208,766	210,364	D.	1,598 0.8
Int. & Gt. Northern.....	677,806	750,466	D.	72,660 9.7
Paducah & Memphis.....	115,527	101,887	I.	13,640 13.4

Six months ending June 30:

Burlington & Mo. River in Nebraska.....	\$735,081	\$415,335	I.	\$319,746 77.0
Net earnings.....	443,827	219,106	I.	224,721 102.6
P. c. of expenses.....	39.63	47.29	D.	7.66 16.2

Month of June:

Bur. & Mo. River in Nebraska.....	\$90,500	\$70,002	I.	\$19,928 28.2
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Month of July:

Cairo & St. Louis.....	\$18,359	\$15,141	I.	\$3,218 21.5
Clev., Mt. Vernon & Delaware.....	28,505	24,484	I.	4,021 16.4
Int. & Gt. Northern.....	92,698	89,500	I.	3,198 3.6
Paducah & Eliza- bethtown.....	26,552	23,880	I.	2,672 11.2
Paducah & Memphis.....	15,130	15,577	D.	447 2.9
St. Louis & S. E., St. Louis Div.....	51,925	43,388	I.	8,537 19.7
St. Louis & S. E., Ky. Div.....	31,027	36,169	D.	5,142 14.3
St. Louis & S. E., Tenn. Div.....	13,200	11,007	I.	1,653 14.3

First Week in August:

Atchison, Topeka & Santa Fe.....	\$95,500	\$48,734	I.	\$46,766 96.0
Chicago, Mil. & St. Paul.....	119,000	119,930	D.	3,930 3.3
Denver & Rio Gr'de.....	28,500	16,695	I.	11,805 70.7
St. Louis, Iron Mt. & Southern.....	85,200	92,903	D.	7,703 8.3

Week ending Aug 9:

Gt. Western, of Can.	\$75,212	\$75,763	D.	\$551 0.7
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Week ending Aug 10:

Grand Trunk.....	\$146,038	\$170,063	D.	\$30,025 17.1
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##### New York and Boston Passenger Rates.

The rail and boat lines between New York and Boston have been competing pretty sharply for passenger business this season. Some of the lines have been carrying passengers for \$1.50, and last week the Norwich & Worcester line put down the fare to \$1, this rate including a berth (but not a state-room) on the boat. The distance is about 240 miles, 112 miles by the New York & New England road from Boston to Allyn's Point, and the rest of the way by boat, so that the rate is about four-tenths of a cent per mile, which is pretty cheap traveling. Fares by the all-rail routes have not been reduced, in spite of the competition of the boat lines.

##### Grain Movement.

For the week ending Aug. 10, receipts of grain of all kinds at eight Northwestern markets has been, for five years, in bushels:

1878.	1877.	1876.	1875.	1874.	1873.
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6,353,446 4,940,613 3,769,648 2,924,504 4,287,152 3,926,551

The receipts this year are entirely without example for this season, and among the largest ever reported for a single week at any season. They have been exceeded but once this



year. Corn forms 46 per cent. of the whole, and that has arrived chiefly at Chicago. Wheat is 33 per cent. of the whole, and nearly a third of it, arrived at Detroit and another third at Toledo, Chicago getting a fifth and St. Louis a trifle less. Milwaukee receipts are a mere trifle, and nearly all the wheat now coming forward is winter wheat.

The shipments of the same markets for the same week have been:

1878.	1877.	1876.	1875.	1874.	1873.
4,872,921	4,285,095	3,044,779	3,125,584	3,347,530	3,769,252

Of these shipments the number of bushels and the percentages of the totals that were shipped by rail were:

1878.	1877.	1876.	1875.	1874.	1873.
1,499,950	950,575	1,300,720	785,771	1,095,988	565,031
30.8 p. c.	22.2 p. c.	42.7 p. c.	25.0 p. c.	32.7 p. c.	15.8 p. c.

The receipts at the seven Atlantic ports for the same week have been:

1878.	1877.	1876.	1875.	1874.	1873.
6,153,764	3,525,053	3,061,105	4,640,166	3,100,960	3,489,237

Of the receipts of the week this year, 51 per cent. arrived at New York, 18.5 at Baltimore, 15.7 at Philadelphia, 7 at Montreal, 6.4 at Boston, 1.3 at New Orleans, and 0.1 at Portland. Philadelphia at last shows an increased movement, which is about one-half wheat. Baltimore, however, received about twice as much wheat as Philadelphia.

For the week ending Aug. 19, receipts and shipments from Chicago and Milwaukee this year are reported as follows:

	Receipts.	Shipments.
Chicago.....	4,799,073	3,103,280
Milwaukee.....	274,900	238,200

The Chicago receipts are among the largest ever known, but only one-seventh of them was wheat.

Receipts and shipments at Buffalo by rail and water for the same week were:

	Receipts.	Shipments.
By rail.....	608,600	1,507,698
By water.....	2,857,190	1,654,580
Total.....	3,525,790	3,162,278

For the same week the receipts at four Atlantic ports were:

	1878.	1877.	1876.	1875.	1874.	1873.
New York.....	3,488,821	1,056,173	1,056,173	1,056,173	1,056,173	1,056,173
Baltimore.....	891,800	409,725	409,725	409,725	409,725	409,725

There has been but one week before this year, and there were but three weeks in the whole of 1877, when the receipts of New York were so large. Of its receipts this year 71 per cent. or 2,486,398 bushels was by rail.

#### Coal Movement.

Anthracite coal tonnages for the week ending Aug. 10 were: 1878, 522,251; 1877, 290,165; increase, 242,086 tons, or 86.4 per cent. Prices of anthracite are unsettled with a probable downward tendency, owing to an unusually small demand.

At the monthly meeting of the Anthracite Board of Control in New York, Aug. 21, September production was fixed and apportioned as follows: Philadelphia & Reading, 286,250; Lehigh Valley, 197,500; Central, of New Jersey, 129,050; Delaware, Lackawanna & Western, 127,500; Delaware & Hudson Canal, 124,800; Pennsylvania Railroad Company, 76,500; Pennsylvania Coal Company, 58,650; total, 1,001,250 tons. This will be a very small production for September. A committee was appointed to consider the question of raising prices. It is said, however, that the Lehigh Valley will not agree to any increase.

Actual tonnage passing over the Huntingdon & Broad Top road for the seven months ending Aug. 3 was:

	1878.	1877.	Inc. or Dec.	P. c.
Broad Top.....	81,574	74,869	I.	8.705
Cumberland.....	66,900	85,992	D.	19.092
Total.....	148,474	160,861	D.	12.387

The coal tonnage of the Pennsylvania Railroad for the seven months ending July 31 was:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite.....	357,844	346,313	I.	11.531
Semi-bituminous.....	870,367	882,535	D.	12.168
Bituminous.....	1,077,426	875,234	I.	202.192
Coke.....	597,956	454,466	I.	143.490
Total.....	2,903,593	2,558,548	I.	345.045

Actual tonnage passing over the Pennsylvania & New York road for the eight months of its fiscal year from Dec. 1 to Aug. 3 was:

	1878.	1877.	Decrease.	P. c.
Anthracite.....	463,490	573,983	110,493	19.2
Bituminous.....	209,216	225,386	16,170	9.2
Total.....	672,706	799,369	126,663	15.8

Of the anthracite this year 290,819 tons were received from the Lehigh Valley and 149,105 tons from the Bloomsburg Division of the Delaware, Lackawanna & Western.

#### Petroleum Production.

Stowell's Petroleum Reporter gives the following statements from the Pennsylvania oil regions for July, in barrels:

	1878.	1877.	Increase.	P. c.
Production, barrels.....	1,283,265	1,189,005	94,260	7.9
Shipments out of region.....	1,330,454	1,196,951	133,503	11.2
Stock, July 31.....	5,031,600	3,004,728	2,026,872	67.5
Number of producing wells.....	8,776	7,567	2,209	29.2

Shipments of refined from Pittsburgh for July were:

	1878.	1877.	Increase.	P. c.
East by Pennsylvania R. R., barrels.....	47,736	34,628	13,108	37.8
East by Baltimore & Ohio R. R.....	4,500	1,232	3,268	265.0
East by Ohio River and Ches. & Ohio R. R.....	1,232	1,232	0	0
West by all lines.....	88,096	88,096	0	0

#### Water Rates.

At San Francisco rates are reported as very much unsettled, with a great many ships in port waiting for charters. Vessels are arriving with previous charters for wheat at 60s. per ton to Liverpool, but charters are reported to load wheat as low as 42s. 6d., 47s. 6d., and 50s. per ton to Cork for orders.

#### RAILROAD LAW.

##### Liability on Duplicate Bills of Lading.

In the Wichita Savings Bank against the Atchison, Topeka & Santa Fe Company, the Kansas Supreme Court decides as follows:

1. Where the agent of a railroad corporation, which is engaged as a common carrier, has authority to receive grain for shipment over its road, and issue in the name of the corporation a single bill of lading for each consignment received, on Sept. 4, 1876, received 23,000 pounds of wheat for transportation to St. Louis, Mo., and, at the instance of the shipper, issues in the name of the corporation two original bills of lading, of the same terms, tenor or effect, for the wheat, and each of which shows the receipt of 23,000 pounds of wheat and its consignment to the order of the shipper at St. Louis, Mo., and the shipper, on Sept. 5, 1876, negotiates one of the bills to W., who, as the holder of such bill of lading, receives all the wheat forwarded to St. Louis, and on Sept. 6, 1876, negotiates and transfers by indorsement in writing

the other bill of lading to the Wichita Bank, and the bank, knowing the custom of the railway corporation to issue only one bill of lading for each shipment, and relying wholly on the bill for its security, accepted the same, advanced money thereon of less amount than the value of the wheat called for, in good faith and in the regular course of its business, and having no knowledge of the issuance of the two original bills of lading; Held, that the shipper being insolvent, and having absconded, the railway corporation is estopped by its statement and promise in the bill of lading to deny that it has received the grain mentioned therein, and is liable to the endorsee and assignee for its advances made in good faith on the bill of lading.

##### Actions Against Receivers.

In Kendall against the Union Trust Company, the Kansas Supreme Court holds as follows:

1. A corporation which has the possession, control and management, and is engaged in the business of running and operating a railroad in this State, is a "railway corporation" within chapter 94 of the laws of 1874, although it is so doing in the execution and discharge of a trust for the benefit of the bond and stockholders of the corporation which built and owned the road, and it is not itself the absolute owner thereof.

2. A demand under that act is sufficient if made upon one who is the "stock and claim adjuster and authorized to settle for stock killed."

##### Killing Stock in Kansas.

In Jones against the Atchison, Topeka & Santa Fe Company the Kansas Supreme Court lately decided as follows:

1. Plaintiff's mare got on to the defendant's track at a place where it ought to have been but was not fenced. Frightened by an approaching train she fled along the track until she reached a tie bridge. Here she either jumped forward or was thrown forward by the engine on to the bridge, and her legs falling between the ties she was fatally injured. Held, that the company was liable under chapter 94 of the laws of 1874.

2. Under that statute no actual collision between the engine and the animal injured is essential to liability; it is enough if the injury occurs in the operating of the railroad and as a direct result therefrom.

3. The proviso in the fifth section of the act implies not merely the lack of a fence, but also the lack of one where no superior obligation forbids a fence, and also the lack of one which might have prevented the injury.

In a similar case, where horses strayed upon a bridge and were caught fast by their legs slipping between the ties, the jury in the lower court decided that there was negligence on the part of the company in so constructing the bridge that animals were liable to be caught. The Supreme Court, however, held that the company was not liable for injuries in consequence of the construction of the bridge, but that it was liable for further injuries inflicted by trainmen in removing the animals.

##### New Jersey Railroad Law.

The Chancellor of New Jersey has given his decision in the matter of the application of the Philadelphia & Cape May Short Line Company for relief from the operation of the amendment to the general railroad law passed last winter. This amendment required a deposit of \$2,000 per mile from all new companies, to be returned as the road is completed, and provided that the deposit should be paid by companies already organized, but whose roads were not yet built. The Chancellor's decision is, in substance, that he has no power to review a legislative enactment, and that the company has no remedy in equity for any injury that may have been done to it by the law. The company claimed that the Legislature had no right to make the amendment apply to companies organized before its passage; it did not make the deposit required, and it was accordingly published by the Attorney-General as having forfeited its corporate franchises. Apparently the Chancellor's decision does not cover the constitutionality of the retroactive clause of the law, but only his own want of jurisdiction in the case. It may be taken up to the Court of Errors and Appeals, and the constitutional question there decided.

#### THE SCRAP HEAP.

##### Railroad Manufactures.

The Jackson & Woodin Manufacturing Co., at Berwick, Pa., is building 100 refrigerator cars for the New York Central & Hudson River road.

The Allentown Rolling Mill Co., at Allentown, Pa., has shut down both its mills on account of want of orders, throwing 500 men out of employment.

The Indianapolis Rolling Mill Co. has contracted to make the iron rails for the Delphos, Bluffton & Frankfort narrow-gauge road.

The National Tube Works Co., at McKeesport, Pa., recently received an order from Russia for 80 tons of oil tubing. The order was received by telegraph Aug. 8, and the tubing was made, sent to New York and put on board the steamer by Aug. 13.

The Fitchburg Railroad shops are building 100 hay cars, to be used on the line between Western New York and Boston by way of the Hoosac Tunnel.

The Chicago, Burlington & Quincy shops, at Aurora, Ill., recently turned out two heavy passenger engines with 17 by 24 in. cylinders. They have Challenger's patent smoke-stack. The car shops are turning out a large number of grain cars.

The rolling mill of the Maiden Creek Iron Works, at Blandon, Pa., started up last week, after a stoppage of nearly two months, during which it has been thoroughly repaired. Out of 13 blast furnaces and three rolling mills in the Lower Susquehanna District in Pennsylvania, eight furnaces and two mills are idle.

Wm. P. Allen & Co. have succeeded Charles B. Allen in the manufacture of cast-steel locomotive and car springs, and of boiler and bridge rivets. Their works are at American and York streets, Philadelphia.

The Gaylord Rolling Mill Co., at Portsmouth, O., has been reorganized and the mills are to be started up soon.

The Shawnee and Vilas furnaces in the Hocking Valley region are in blast and doing well.

Bradley, Reis & Co., owners of the Neshannock Iron Works at New Castle, Pa., have gone into bankruptcy. This failure results from those of Reese, Graff & Woods, of Pittsburgh, and Kimberly, Carnes & Co., of New Castle.

##### Bridge Notes.

The Board of Supervisors of Panola County, Miss., will receive at its meeting to be held in Sardis, Sept. 2, bids for the erection of an iron bridge over Tallahatchie River, at Belmont Crossing, as per plans and specifications filed with the clerk. Bids will be received either for the superstructure alone, or with piers and foundations; bids will also be received for the approaches to the bridge.

The contract for a highway bridge over Wood Creek, at Rome, N. Y., has been let to the Wrought Iron Bridge Co., of Canton, O.

##### Notes.

Railroad men are fond of giving names to trains, some-

times without rhyme or reason. Owl and Modoc are common names for night trains and are used on many roads. The Shoo-fly train runs on one Western road, and the Rat train passes daily over the East Tennessee, Virginia & Georgia. On the Delaware Division of the Erie there is an accommodation known by the mysterious name of Hojack, and on the Eastern Division one of the regular freights is the Newark Horn train. Similar names may be found on many roads, some apt and fitting, some merely ridiculous, most of them probably originating in some local catch-word, or in some trainman's nickname.

Trains can run off one rail as well as two. They put a locomotive on the one-rail road at Bradford, Pa., the other day, but it tumbled off and knocked down some of the road.

Size is always relative. An exchange speaks of the immense freight business just now done on the road passing through its town. Coming down to particulars we find that in "the last 24 hours there were four heavy freight trains, 57 cars in all, passed northward." A New York Central or Pennsylvania man would hardly call this an immense business.

Links and pins are not only a source of expense to companies, but by their absence they make the average brakeman's life a burden. A missing link or pin will also cause a frightful amount of profanity.

A wicked exchange says that the officers of the Pullman Company do not sing "I want to be an angel," but they shout "I want to catch an angel" in vindictive chorus.

The Enquirer tells of some of the ways in which Cincinnati carried her railroad tax: "A German citizen came up to the Seventh ward polls with a ticket bearing the word 'Nein.' 'Good gracious, my friend,' said an electioneer, 'don't vote for 'nein' millions; two is bad enough. Here, vote this.' The German was very much amazed at his narrow escape, and placidly voted 'Yes' in English."

##### How to Build and Run a Cheap Road.

The Philadelphia Times of Aug. 21 gives the following summary of some testimony taken on the petition to remove the Receiver of the Philadelphia & Atlantic City road: "Twenty-one witnesses for the petitioner were examined, among them John H. Burrell, formerly General Passenger and Freight Agent and Secretary and Treasurer pro tem. of the company; Clark H. Brown, Superintendent of Construction; John C. Hilliard, Roadmaster; John McAlees, Truman Robinson, Darwin R. Cafferty, Emanuel Bittle, John McAllister and Alexander Brown, locomotive engineers, and George Threlfall, Master Machinist. The following are the principal points testified to by the different witnesses: Mr. Richards appears to have the supreme control of the road. The road, which was built under the immediate supervision of Mr. Richards, who was then President of the company, was not properly constructed. Some of the cuts were so narrow that the cars could scarcely get through. The embankments were and are so narrow that they do not give proper support to the ends of the ties, making the road unsafe at the high rate of speed which is maintained. The grading was very bad. At one place the road-bed was four feet below grade, and at another, 400 distant, it was eight feet above grade. The approaches to the bridges were so much too low that an eight-wheeled engine in going on to a bridge had two wheels suspended in the air. At one place the road descended and ascended so sharply that a locomotive got stuck in a hole and could neither go forward nor backward. There was only one water-tank on the road, and the engineers had to stop and dip up water from the creeks in buckets. There were no lock switches on the road, and none of the switches had or have targets. Switches had to be made by unsipping the rails. At the time the opening excursion was made, July 25, 1877, when an accident occurred, whereby one man lost his life, the road was in such bad condition that the Superintendent of Construction warned Mr. Richards not to run the train, and resigned his position because his warning was not heeded. The engines on the road have the Shaw nozzle, which is inferior to the ordinary nozzle. Locomotives having the Shaw nozzle consume more coal, throw more fire and make less steam. The Shaw nozzle is not in general use. Mr. Richards is interested in the manufacture of the Shaw nozzle, and discharged some engineers for speaking against it. The present condition of the road is very bad and unsafe. As a rule, passenger trains are several hours behind time, and freight conductors run on their own time and get through when they can. There are not sufficient men employed in the repair gangs to keep the road in good order, and these have frequently been taken off to do other work. The company's ferryboat, Minnie R. Child, is rotten and unsafe. Mr. Richards frequently discharges men without consulting his subordinates, under whose immediate control the men are.

"The above is the gist of the testimony given yesterday. Mr. Drake saying that he had about a dozen more witnesses to examine, the hearing adjourned until nine o'clock this morning."

##### The Westinghouse Brake on Freight Trains.

A test of the utmost importance to railroads was made a few days ago, on the Denver & Rio Grande road, at Veta Pass, the result of which has just come to hand. It was the trial of the Westinghouse air brake upon a freight train, and it was fully demonstrated that the invention is just as practical and operative upon a train of heavily loaded freight cars as it has so often been proven to be upon passenger trains. The Veta Pass is 9,300 feet above the level of the sea, and the grade of the track through it is something remarkable. On the portion of the line where the test was made is a down grade of 211 feet to the mile. To those who have traveled the Pennsylvania road, and noted with care the descent on the mountains from Kittanning Point to the Horse-Shoe bend, the above figures will give a partial idea, for the steepest grade of the Pennsylvania road is 96 feet to the mile. The experiment was made with a train of 12 flat cars loaded with green lumber and weighing nearly 200 tons. The train was running at a good rate of speed, but by the application of the brakes was stopped short in a distance of 440 feet in 22 seconds, and with the throttle of the engine wide open. A special feature of the test is that the air at the Veta Pass only sustains a column of mercury 21 inches, so that the pumps of the brake have to compress the air through nine-thirtieths of the stroke to get air of the same density as the pumps take in at the sea level.—Pittsburgh Telegraph, Aug. 19.

[There never has been any question but that this brake would work on freight trains; the cost has been the obstacle.]

##### Quick-Witted Brakeman.

Major Rube Allen, Commodore Vanderbilt's favorite veteran engineer of the Central road, a man of giant stature with a brave heart, which is as tender as a woman's, has a new hat for one of his freight brakemen of the road when he can find the right man. One day last week he was coming to Utica, drawing an express train with the "W. H. Vanderbilt." Just as he approached one of the small stations he saw the foreman of a section gang standing sideways in the middle of the passenger track, apparently



watching a passing freight train. Rube quickly tooted his steam whistle, but the noise made by the freight must have drowned it, for the foreman never stirred. Rube continued the signal, whistled for brakes and reversed, but the man stood still as if in a reverie. The locomotive had approached so near that Rube could hear the brakeman who stood on the top of his train call out to the trackman and see him move his hands despairingly as if he feared that he could not save the man. The express was running at a high rate of speed, and could not be stopped in time. The old engineer was about to shut his eyes to avoid a sight of this mangled victim, when he saw the brakeman quickly pull off his hat, roll it into a ball and throw it at the man. Fortunately it hit him squarely on the head, and giving a quick backward motion, the trackman just cleared the rails as the locomotive went thundering by. Old Reuben says his heart seemed to come up into his mouth for a minute, and he could not help crying out for joy. He knew that the quick-witted brakeman's old hat was cut to pieces and he says that he should have a new one "if he never lays up a cent."—*Utica (N. Y.) Herald*.

#### Experiments on Steel Rails.

These experiments were made on steel rails ordered for the Transvaal Republic, and manufactured by John Cockerill & Co., of Seraing. They were of the Vignoles type, weighing 56 lbs. per yard, and of the following dimensions: Height, 3.9 inches; breadth of foot, 3.9 inches; breadth of head, 2.2 inches; thickness of web, 0.4 inch. Sixteen rails were experimented on, and the tests and the results were as follows:

(a) The rail was to be placed on bearings 3 feet 7 inches, and receive a blow from a weight of 1,102 lbs., falling freely from a height of 19 feet 6 inches, without showing a set of more than 1.8 inch; and was then to be turned over and straightened back again under similar blows without breaking. The whole of the rails bore this test well, the largest set under the first blow being 2.1 inches. They were subsequently nicked in the foot, and then broken by blows of the same weight; the number of blows required varied from one to eight, the last number occurring with a rail which had been a long time under a hot sun, and may thus have been rendered more ductile.

(b) The rail, placed on the same bearings, was to support a weight of 9.8 tons at the centre for five minutes without showing any permanent set; and subsequently a weight of 27.5 tons under the same conditions without breaking. The whole of the rails bore both these tests satisfactorily, the permanent sets in the second case varying from 1.97 to 4.9 in.

(c) From each charge two small ingots were taken, and forged into bars 0.8 in. square, which when cold were bent double without breaking; the object of this test being to show that phosphorus, sulphur and silica were not present in an inordinate degree.

(d) Four pieces were cut off finished rails, forged into square bars, and then turned down to four different diameters, 0.59, 0.63, 0.61 and 0.73 inch respectively. These specimens, each 4 inches long, were then tested separately in a hydraulic press for tensile strength. The three first specimens behaved nearly alike, beginning to stretch sensibly at about 22.2 tons per square inch, and breaking at about 38 tons to the square inch, with a final extension of about 18.5 per cent., and contraction at the point of fracture of about 16 per cent. The fourth specimen began to lengthen at about 19 tons, and broke at 34.3 tons; but from the fracture it appeared to have been somewhat overheated, and thus not to give a fair test.

The above results show sufficiently the nature of the steel, which belonged to the category called in Belgium "Trés-tendre," or "Tendre," not capable of hardening in water. These qualities have from 0.18 to 0.20, and from 0.20 to 0.28 percentage of carbon respectively, and were used in this case on account of local circumstances, which did not allow of the quality "demi-dur," which is preferred in Europe. This quality has 0.28 to 0.30 percentage of carbon. The charge of raw material used by Messrs. Cockerill when making this steel is given in detail, and also its chemical composition when melted.

#### Railroad Library.

Col. C. M. McGhee (of the East Tennessee, Virginia & Georgia), while in the city yesterday afternoon, was so pleased with the library room of the Railroad Association that he expressed his intention of fitting up just such a room at Knoxville, for the use of his men there. The Colonel fully appreciates the value of such an association to men who have so little time for reading or recreation, and who are so liable to be led into temptation. He will, therefore, provide them a comfortable room, where the evenings can be spent in perusing instructive periodicals and books, as well as the lighter literature of the day.—*Chattanooga (Tenn.) Times*.

#### Prices of Rails.

Sales reported last week were 2,000 tons steel and 2,000 tons iron rails for Western delivery. Steel rails are quoted at \$41.50 to \$44 per ton at mill; iron rails at \$32 to \$36 per ton at mill. In old rails there was no business; prices nominally \$17.50 to \$18.50 per ton. At Philadelphia steel rails are quoted at \$42 to \$44 per ton, with most of the mills fully employed. Iron rails are reported at \$32 to \$35 per ton; mills fairly busy, but reported as willing to accept low prices for prompt cash.

#### Accident on a One-Rail Railroad.

At 10 o'clock, yesterday, the regular passenger train on the Elevated Railroad, Bradford, met with a serious accident a few moments after leaving the depot. The train of two open cars was well filled with passengers and drawn by a locomotive recently built at Philadelphia, and now on trial under the management of an employé of the Baldwin Engine Works. The locomotive was so much heavier than was ordered that grave fears were entertained that it would not prove satisfactory, and only yesterday its contractors were notified that it failed to answer the purpose. The immense weight of the engine was placed so high as to make it top heavy, causing it to sway terribly from side to side, and to this cause the accident yesterday is attributable. Three rods from the creek this swaying motion loosened the timbers of the track, noticing which the engineer promptly shut off steam. The train moved along fifty yards, tearing the timbers and completely demolishing the track. The cars were at once upset, falling entirely over on their sides, thus exposing the passengers to imminent danger of life and limb. Half way across the stream the engine stopped, having struck against one of the upright posts, which alone prevented it from tumbling into the creek upside down. As it was, it struck firmly at an angle of 45 degrees. The fireman and engineer managed to escape unhurt. All the passengers did not fare so well, over a dozen sustaining injuries of greater or less severity.

Frank Maginnis was badly cut about the head and face, and Dr. Mortimer, of Derrick City, was so bruised over the chest that he had to be assisted home. One man received an ugly gash above the left eye, and several were painfully bruised on the limbs. A number were unceremoniously dumped into the creek, getting a thorough drenching. How so many escaped unhurt is a mystery, as the track is eight or ten feet high at the scene of the accident, and the cars fell off

sidewise. Fortunately the train had not acquired great headway, being so short a distance from the starting point; otherwise sad loss of life and much personal injury must have ensued. The road will be repaired without delay, but it is not likely the same engine will again be afforded an opportunity to cause a repetition of the catastrophe.—*Oil City (Pa.) Derrick*.

#### A Valuable Train.

The big train that passed on the Rock Island road, Monday night, consisted of 84 car-loads of tea, two car-loads of silk, and one car-load of general Chinese merchandise. The tea was billed as follows: Thirty-one cars to New York and three cars to Montreal. The silk also goes to New York. The whole 37 car-loads of freight are valued at \$550,000. The train will be divided at Chicago, one-half going east via the Michigan Central and the other via the Port Wayne road.—*Des Moines (Ia.) Register*, Aug. 14.

#### A Big Blast.

A dispatch from Easton, Pa., to the Philadelphia Times, dated Aug. 16, says: "The great blast for which preparations have been making since Feb. 16, in the Glendon Furnace limestone quarries, was fired last evening at 7:50 o'clock. These quarries are situated one mile above Easton, on the Lehigh River, and from them all the limestone used in the large furnace is obtained. The idea of making so large a blast was to loosen enough stone to supply the demand for a long time without further need of blasting. Crowds of people swarmed the surrounding hills and points of observation, to witness the explosion. A flash of light, a muffled sound, and the event was over, successfully and without accident. The manner of working the drilling and blasting is interesting. A gangway of 240 feet was cut into the rock from the western side of the hill. Four drifts were cut on the south of this gangway and at the end of each was sunk a shaft varying in depth from 18 to 24 feet. At the bottom of each shaft, in a cube 5 ft. 3 in. each way, was placed a powder box, measuring 4 ft. 8 in. In shaft No. 1 was placed 2,800 pounds of powder; in No. 2, 2,700 pounds; in No. 3, 3,000 pounds, and in No. 4, 3,500 pounds. This total of 12,000 pounds of powder was placed in the powder boxes in four hours' time by 60 men, who passed it along, keg by keg, to the top of the shaft; then it was run into the boxes through funnels and pipes. This work was done in total darkness, as it was deemed unsafe to use light. The powder was then lightly tamped, and 6,000 kegs of sand were placed upon it. Limestone was placed upon the sand and the drifts blockaded. In the center of each box was placed an exploder, consisting of fulminated mercury with fine platinum wire one-thousandth of an inch in diameter running through. To the platinum wires were attached wires running to a 26-cell battery on a hill 300 feet away. Mr. Frank Firmstone, Superintendent of the Glendon Iron Company, gave the word when all was ready, and Mr. Ellis Clark, Jr., the Engineer, closed the circuit. No more noise was heard than the noise a two-horse wagon would make running over a road. It is estimated that if 60,000 tons were broken the effort would pay, but it is now thought that 100,000 tons of rock were moved."

#### Canadian Managers' Salaries.

A correspondent of the St. John (N. B.) Telegraph, referring to some statements made as to Mr. Brydges' salary as Superintendent of Government railroads, gives the following statements as to salaries paid managers of Canadian roads:

	Miles of Road.	Salary.
Mr. Broughton.....Great Western.....	800	\$17,500
Mr. Muir.....Canada Southern.....	322	15,000
Mr. Hickson.....Grand Trunk.....	1,388	15,000
Mr. Cumberland.....Northern.....	167	10,000
Mr. Reynolds.....Ottawa & St. Lawrence.....	50	10,000
Mr. Brydges.....Intercolonial & Prince Edward Island.....	837	8,000

#### Government Contracts.

Captain Charles B. Phillips, United States Engineers, will receive at his office in Norfolk, Va., until Sept. 18, proposals for dredging in the harbor of Edenton, N. C.

Captain A. N. Damrell, United States Engineers, will receive at his office in Mobile, Ala., until Sept. 14, proposals for the removal of wrecks in the harbor of Pensacola, Fla.

Lieutenant Colonel John Newton, United States Engineers, will receive at his office, Army Building, corner Houston and Greene streets, New York, until Sept. 3, proposals for dredging Otter Creek, Vt.

Major John M. Wilson, United States Engineers, will receive at his office in Portland, O., until Oct. 1, proposals for furnishing labor and materials for the construction of a portion of the canal and locks at the Cascades of the Columbia River, Oregon. Plans, etc., can be seen and blank forms obtained at the office in Portland.

At Newport, R. I., Aug. 19, contracts were awarded as follows: Rip-rap granite for jetty at Saybrook, Conn., to Francis H. Smith, New York, at 77 cents per ton; rip-rap granite for breakwater at Hyannis, Mass., to J. H. White, Hyde Park, Mass., at \$1.45 per ton; dredging in Salmon River, Conn., to Beardsley Brothers, Bridgeport, Conn., at 14½ cents per cubic yard; excavation in Providence River, R. I., to E. R. Seward, Albany, N. Y., at 11½ cents per yard; excavation in Little Narragansett Bay, to E. R. Seward at 30 cents per yard and \$6.75 for boulders over a yard.

#### A Railroad Incident in India.

Railway employment in India is naturally diversified, and the duties sometimes are frequently of a curious nature. We learn from the Rajpootana State Railway that at one of the stations situated in the Jeypore Rajah's territories, a tiger assumed charge of the station. Of course the native staff bolted, but before the station master resigned charge to Mr. Stripes, he thought it necessary to communicate with his immediate official; so he flashed off the following orthodox telegram: "Tiger promenading platform, please arrange for removal." Thinking he had completed all needful arrangements, the station master gracefully retired to the top of the station house, leaving Mr. Tiger in full charge.

#### Disasters Caused by Wash-outs.

Some one has sent to the Springfield Republican the following notes of a few of the notable disasters that have occurred upon the railroads of this country in consequence of washing out of culverts and undermining of bridges by freshets:

June 27, 1859—A culvert was washed out upon the Michigan Southern & Northern Indiana Railroad, near South Bend, Ind. A passenger train ran into the chasm about 10 o'clock at night. Forty persons were killed and 60 wounded.

July 29, 1872—A bridge was undermined by a freshet on the Kansas Pacific Railroad, and a passenger train ran into it. Five persons were killed and eight wounded.

April 19, 1873—A culvert was washed out on the Stonington & Providence Railroad at "Richmond Switch" in consequence of failure of dam above it. A passenger train ran into the chasm about 10 o'clock at night. Four persons were killed and 20 wounded.

Aug. 13, 1874—A bridge was carried away by a freshet during the night, on the Southeastern Railroad of Canada,

near Sutton, Province of Quebec, and a passenger train ran into the chasm at early morning. Five persons were killed, and 15 wounded.

Oct. 4, 1874—A culvert was washed out on the Pennsylvania Railroad at Milford, N. J. A passenger train ran into the chasm, and a part of the train was swept out into the Delaware River. The freshet was then at its greatest height. Seven persons were killed, four seriously wounded.

Oct. 4, 1874—By the same storm that caused the last disaster an embankment was washed out upon the Philadelphia & Reading Railroad. A passenger train ran into the chasm. Seven persons were killed, 50 wounded.

Aug. 29, 1877—A culvert was washed out by a sudden freshet, on the Chicago, Rock Island & Pacific Railroad, near Des Moines, Iowa; a passenger train was thrown from the track down an embankment and into a creek. Seventeen persons were killed and 39 wounded.

Aug. 7, 1878—A culvert was washed out at Northfield, Mass., on the New London Northern Railroad line, and a passenger train ran into the chasm, about 11 o'clock at night. Three persons were killed, three wounded.

The above comprises only a list of the disasters attended with a serious loss of life. During the four years ending Sept. 30, 1877, there were 109 detachments of trains reported, caused by washing out of road-bed. The number that were discovered in time to prevent disaster to train was probably "legion."

#### OLD AND NEW ROADS.

Allegheny, Kennerdell & Clintonville.—This road was built last year from the Allegheny Valley at Scrubgrass, Pa., to Kennerdell, 2½ miles. It was built to serve a part of the Bullion oil district, but the failure of the wells it reached has deprived it of business. The iron has been taken up and sold, and the road bed will be changed to a wagon road.

Baltimore & Ohio.—English papers of Aug. 9 say that the previous week President Garrett visited Barrow, with the object of concluding negotiations with Sir James Ramsden, Managing Director of the Furness Railway Company, for the establishment of a line of steamships between Barrow and Baltimore.

Buffalo, Corry & Pittsburgh.—The reported sale of this road to A. H. Buttman, of Boston, has fallen through, and last week an effort was made to raise money enough along the line to buy it and put it in operation again.

A Cleveland (O.) dispatch of Aug. 17 says that Mr. Wm. E. Lewis has bought the road for \$75,000 and will at once make arrangements to work it and put it in order. Mr. Lewis recently bought the Lake View & Collamer, a Cleveland suburban road. It is stated that he will organize the Chautauqua Lake Railroad Company.

Burlington, Cedar Rapids & Northern.—This company recently acquired possession of the 10 miles of the Chicago, Clinton & Western road from its main line at Elmira to Iowa City. It is now said that the company will extend this branch from Iowa City southward to Riverside, some 12 miles, and that it will take up the track from the 15 miles of its Muscatine Division between the main line at Nicholls and Riverside, using the iron on the new branch. It is also proposed to extend the branch some 15 miles beyond Riverside, to Washington.

Camden & Atlantic.—This company has decided to lay a second track at once from Camden, N. J., to Haddonfield, seven miles, a section of the road where there are many local trains. This track will be laid this fall, and probably extended next season. The company is also considering the question of ballasting the whole road with stone, in place of the gravel now used.

Chicago & Alton.—The freight houses of this company in East St. Louis were burned on the night of Aug. 16, with nine freight cars and 30 transfer wagons. There were two buildings, each 25 by 250 feet, and both were pretty well filled. The loss is variously estimated at from \$30,000 to \$75,000, the value of the freight destroyed being uncertain. The fire is said to have been caused by sparks from a locomotive falling on some cotton on a platform.

Later dispatches say that the loss is covered by insurance, except some \$2,500. The freight houses will be rebuilt at once, and, meantime, the old passenger house can be used as a freight depot.

Chicago, Burlington & Quincy.—This company has decided to replace the trestles on the line of the Fox River Branch, from Aurora, Ill., to Streator, with stone culverts and earth filling. Work is now in progress at Dayton, Wedron, Sheridan and Blake's Ravine, the trestle at the last-named place being 70 feet high over the stream.

Chicago Milwaukee & St. Paul.—This company has, it is said, sold \$1,000,000 of its Iowa & Dakota Division bonds at 91, to pay for the extension of that division now in progress. Reports are also current that the company has this year sold \$1,480,000 of its consolidated bonds, with which it has retired \$210,000 old bonds, bought the Madison & Portage and the Dubuque Southwestern roads and is now extending the Hastings & Dakota Division. No official statement has been made in the matter.

The Commercial and Financial Chronicle says: "It has been stated at different times, in communications to the daily newspapers, that the Chicago, Milwaukee & St. Paul preferred stock is cumulative; or in other words, that if 7 per cent. is not paid on this stock out of the earnings of a certain year, it has a claim on the earnings of the next year. Therefore, no dividend could be paid on the common stock until 7 per cent. for all past years had been paid on the preferred. This statement seems to be plainly erroneous, and the claim of the preferred stock appears to be limited to each current year by itself. The preferred stock certificates read as follows:

"This stock is entitled to a dividend of 7 per cent. per annum from the net earnings for each current year. \* \* \* This certificate and stock represented hereby is issued and received subject to all the terms, conditions and limitations of the articles of association of this company."

"The terms and conditions of the articles of association referred to in the certificate read as follows:

"The said preferred stock, except scrip stock, shall be entitled to a dividend of 7 per cent. per annum, from the net earnings of each current year, after payment of interest on all the mortgage bonds, if the company earn so much during the current year, and before the payment of dividends to any other class of stockholders; but the company may reserve a reasonable working capital or surplus, before the dividend shall be declared or paid on said preferred stock, which surplus shall not exceed at any time the aggregate sum of \$250,000, over and above the floating or unfunded debt, and the accrued interest on the mortgage bonds. If the net earnings of the company are not as much as 7 per cent. in any one year, then the said preferred stock shall receive for that year a dividend of whatever the said net earnings are, after the payment of interest on the mortgage bonds, and the reasonable reserve for a working capital, as above described. Said preferred stock shall not have any



claim upon the earnings of any other year, for the non-payment of dividends of any preceding year. And whenever the company earns sufficient, over and above the payment of interest on the bonds and the reserve above named, to pay a greater sum than 7 per cent. on said outstanding preferred stock, and 7 per cent. on the common stock, then the said preferred stock shall share *pro rata* with the common stock in such earnings."

**Chicago, St. Louis & New Orleans.**—The quarantines established by the inland towns, to protect themselves against the spread of yellow fever from New Orleans, have so embarrassed the running of trains, that the through passenger trains have been abandoned for the present. Mails are carried to New Orleans by special locomotives or freight trains. The only other point on the road seriously affected is Grenada, Miss., and trains are run through there without stopping, the connection with the Mississippi & Tennessee at that point being given up.

**Cincinnati, Hamilton & Dayton.**—Suits have been begun in the United States Circuit Court by the Grand Rapids & Indiana and the Pennsylvania Railroad Company against this company, to compel it to pay one-third of the deficiency on certain coupons of the Cincinnati, Richmond & Fort Wayne road. The interest on the bonds of that road was guaranteed jointly by the three companies, but it is alleged that the Cincinnati, Hamilton & Dayton has failed to pay one-third of the amount required, in addition to the earnings of the road, to pay the coupons, as required by its joint guarantee.

**Cincinnati Southern.**—At the annual meeting of the Common Carrier Company in Cincinnati last week, it was stated that the subscriptions to the company's stock amounted to \$263,750, of which \$261,350 have been paid up. Under the lease granted by the trustees to the company the completed section of 157.5 miles, between Ludlow (opposite Cincinnati) and Somerset, Ky., was opened for passenger traffic July 23, 1877. The service consisted of one passenger train in each direction over the line daily. On Aug. 13, 1877, regular freight trains were placed on the road, running at first tri-weekly in each direction. On Dec. 16, 1877, the bridge over the Ohio River and temporary structures on McLean avenue being completed, freight and passenger service were extended to Cincinnati. At present freight, passenger, mail and express services are performed daily between Cincinnati and Somerset, 158.3 miles; double daily between Cincinnati and Danville Junction, 118.5 miles. The traffic in freight and passengers has been purely local in its nature.

The operations up to June 30, 1878, were as follows:

Earnings from passengers.....	\$134,823
" " freight.....	216,064
" " other sources.....	15,090
Total earnings.....	365,977
Expenses (39.73 per cent.).....	145,653

Net earnings.....\$220,324

Under the lease the Common Carrier Company is entitled to deduct from the net earnings 10 per cent. interest on its capital, and also to a further allowance of 10 per cent. on the balance remaining, the rest being paid over to the trustees.

The number of passengers carried was 132,830.

**Credit Valley.**—It is reported that this company has placed enough of its bonds in England to complete the road from Toronto, Ont., to St. Thomas and Elora, and that the rails have been bought.

**Dayton, Sheridan & Grande Ronde.**—Latest advices from Portland, Oregon, state that a second locomotive and a large quantity of railroad iron had been delivered at Dayton, Oregon, for this road. Work on the road is progressing rapidly. Grading has been completed from Dayton to Sheridan, and also to Dallas. All the ties have been delivered for 22 miles to Sheridan, and 20,000 more for the extension to Dallas. About 17 miles of iron and track fixtures have been delivered, and more will arrive by each return of the steamer. Six miles of track have been laid, and the locomotive Pioneer and four cars are busy carrying iron and ties to the front for the track-layers. Two-thirds of the bridging has been completed, and it is expected to have the road completed to Sheridan by Sept. 1, and to Dallas by Oct. 1.

**Detroit, Lansing & Northern.**—On the extension northward of the Stanton Branch, track is now laid to the crossing of the Chicago, Saginaw & Canada at Edmore, Mich., which is about 10½ miles north of Stanton, and six miles beyond the late terminus at McBride's. Work is progressing toward Blanchard's Dam, seven miles further.

**East Line & Red River.**—Track is now laid to Leesburg, Tex., seven miles westward from the late terminus at Pittsburgh, and 52 miles from Jefferson. Work is progressing on the extension to Sulphur Springs, 28 miles beyond Leesburg.

**Erie.**—Mr. Jewett's report as Receiver for May, as filed with the Court, is as follows:

Balance, May 1.....	\$78,063.12
Receipts.....	2,134,684.18
Total.....	\$2,212,747.30
Disbursements.....	1,806,725.79
Balance, June 1.....	\$346,021.51

The total amount of Receiver's certificates and notes issued up to May 31 was \$13,342,083.29; paid and cancelled, \$11,970,710.32, leaving \$1,371,372.97 outstanding at that date.

**Genesee Valley.**—It is proposed to use the Genesee Canal as a road-bed for a railroad, and to lay track upon it from Mt. Morris, N. Y., the terminus of a branch of the Erie, south by west to Cuba on the Western Division of the same road. The distance is nearly 50 miles, and the track, if laid, would complete a line from Rochester parallel to and about 15 miles to the east of the Rochester & State Line, passing through a number of towns now without railroad facilities. Meetings are to be held along the line to work up the project.

**Geneva & Lyons.**—The completion of this road was recently noted under the head of Syracuse, Geneva & Corning, but, though practically an extension of that road, it is a separate organization. It has been built and is owned by the New York Central & Hudson River Company; it extends from the Auburn Branch of that road at Geneva, N. Y., northward 15 miles to Lyons on the main line, and is especially designed as an outlet to the main line for the large coal traffic brought to the road at Geneva by the Syracuse, Geneva & Corning and the Lehigh Valley roads.

**Gulf, Colorado & Santa Fe.**—Mr. James Sorley, Vice-President of this company, recently stated to the *Galveston News* that the directors had held a meeting and had concluded a contract with Mr. Brooks to complete the 80 miles that remain to be finished in order to save the charter franchise, and that he had signed, by authority, a condition-

al contract with Mr. Brooks to construct the road to Belton, at a given figure, for cash, should the stockholders see proper to ratify the negotiations effected by Mr. Kopperl, and which, no doubt, they would do. He said that it would not be just to Mr. Brooks, nor a proper act on the part of the directors, to give the figures agreed upon until the time is matured when the contract will become binding, but it was a most excellent arrangement, and met the hearty indorsement of every member of the board of directors.

**Hartwell Branch.**—It is proposed to build a line from Hartwell, Ga., to Bowersville, to connect there with the Elberton Air Line road, now under construction. The distance is 10 miles, the line nearly level and crossing no large streams, and it is thought that it can be built for \$35,000. Efforts are being made to raise the money along the line and in Atlanta.

**Indianapolis, Delphi & Chicago.**—This narrow-gauge road is now completed to Monticello, Ind., nine miles southeast from the late terminus at Bradford and 26 miles from the western end of the road at Rensselaer. At Monticello it connects with the Logansport & State Line Branch of the Columbus, Chicago & Indiana Central. The extension was formally opened for traffic Aug. 14, by an excursion and picnic at Monticello, and regular trains are now run through.

**Intercolonial.**—The preliminary works for the deep water terminus at St. John, N. B., are now completed; they include a breakwater for the protection of the harbor, and a wharf on which the track leading from the main line of the road around the head of Courtenay Bay is carried, and cost some \$340,000. Work is now in progress on the wharves of the new terminus. These include a long pier or breakwater, covering a slip 630 feet long, and varying in width from 100 to 175 feet; this will have a depth of from 12 to 30 feet of water, and will be used for coasting vessels and lumber schooners. Beyond this will be a large pier having a face of 605 feet on the northern side with water deep enough for the largest vessels. The wharves are built of birch, pine and hemlock, and will be filled in with ballast. They will accommodate all the ships likely to come to the port for loads, and there will be erected on them all necessary freight and storage sheds, coal sheds and possibly a grain elevator. The plans for the wharves were prepared by Mr. Henry F. Perley, the Government Engineer; Mr. George E. McLaughlin is Engineer in charge of construction, and Mr. James T. Kennedy, of Indiantown, N. B., is the contractor. The contract requires all the wharves and slips to be completed by Oct. 1, 1879.

**Lake Huron & Southwestern.**—This road is now completed from Tawas City, Mich., on Lake Huron, west by south to the Au Gres River, 13 miles. A train is running and the terminal station has been named Camp Watson. Some nine miles more of the road are being graded. It is a narrow-gauge road, and is built to carry lumber to the lake.

**Manchester & Keene.**—The nine miles of this road from Greenfield, N. H., westward to Hancock, on which track was laid last December, were formally opened for business Aug. 13. The line is worked by the Nashua & Lowell Company, which has made considerable advances to aid in its construction, reserving the right to work the road until repaid. A large force is now at work on the 21 miles between Hancock and Keene.

**Memphis & Vicksburg.**—This company has let a contract for some 25 miles of its narrow-gauge line from Vicksburg, Miss., northward, to J. S. Hamilton & Co., who agree to have it running to Rolling Fork by Sept. 1, 1880.

**Montclair & Greenwood Lake.**—The joint committee of bondholders has adopted a plan of reorganization which provides for the purchase of the road and the organization of a new company which shall issue first-mortgage income bonds for the same amount as the present first-mortgage bonds; second income bonds for the present second-mortgage bonds, and the stock to the amount of 20 per cent. of the present stock. Bondholders to have votes, and all bondholders to pay a cash assessment of 6 per cent. on their holdings. This plan was accepted at a meeting of bondholders held in New York Aug. 16.

Aug. 17 an application was made to the Chancellor of New Jersey by some of the second-mortgage bondholders, for an injunction to prevent the sale, preparatory to a review of the foreclosure proceedings, on the ground that the decree had been obtained by collusion, and that the bonds had not been sold, but hypothecated at a very small percentage of their face value. The Chancellor refused to grant any injunction, but, by consent of counsel, the sale was postponed one week, until Aug. 24.

**New Hampshire Railroad Taxation.**—The New Hampshire Legislature has passed the bill providing for the taxation of railroad property at a rate equal to the average rate of all the towns through which a railroad passes. Railroads are to be assessed by a State Board of Equalization, to be appointed by the Supreme Court. Railroad companies are required to furnish to the Board such information as it may call for to aid it in assessing the value of the property.

**New Jersey West Line.**—Traffic on this road is suspended on account of a bad wash-out near Basking Ridge, N. J., which carried away a high bank and left a gap in which the only engine in use on the road was wrecked.

It is announced that the road has been leased to the Delaware, Lackawanna & Western Company, which will take possession Aug. 30, and will put it in good order at once. It will be worked as a branch of the Morris & Essex Division. The completed road is 15 miles long, from Summit, N. J., to Bernardsville. It was sold under foreclosure Aug. 3.

**New York, Sea Beach & Coney Island.**—This company has been organized to build a road from a point near the Gowanus Canal in Brooklyn, N. Y., south by east to a connection with the Bay Ridge Branch of the New York & Manhattan Beach road. The distance is about three miles and the capital stock is to be \$50,000.

**New York, West Shore & Chicago.**—In view of the approaching sale of the property of this company, a circular has been issued to stockholders of the Continental Railway & Trust Company, which contracted to build the road and holds most of the \$5,050,000 bonds issued, requesting them to meet and appoint trustees to buy the property, and also to pay an assessment for the purpose of paying expenses of foreclosure.

The road was to extend from Jersey City up the west side of the Hudson to Athens and thence to Buffalo, with a branch to Albany. There is little property except an unfinished tunnel at West Point and the Elysian Fields property at Hoboken, opposite New York, which is pretty well covered with mortgages given for the purchase money.

**Olympia.**—This railroad is now completed from Olympia, Wash. Ter., southeast to Tenino, on the Pacific Division of the Northern Pacific, and was formally opened for traffic recently. It is 15 miles long, and of 3 feet gauge, and has been built by an organization known as the Thurston County Construction Company, chiefly by the aid of county bonds voted to the road.

**Ohio & Mississippi.**—Receiver King's report for July is as follows:

Balance, July 1.....	\$140,479
Receipts from all sources.....	340,634
Total.....	\$481,106
Vouchers, etc., prior to November, 1876.....	\$390
Vouchers, etc., subsequent to November, 1876.....	257,863
Interest on bonds due Jan. 1, 1878.....	220,321
	478,574

Balance, Aug. 1.....\$2,532

A reported movement among the stockholders to raise money by assessment to relieve the company from its difficulties, is denied. No action has been taken by the stockholders, and none is expected.

**Pennsylvania.**—The bridge over the Monongahela at Port Perry, Pa., and the connection at that point with the Pittsburgh, Virginia & Charleston road are now about completed and will soon be brought into use. The connecting track is about one mile long, leaving the main line of the Pennsylvania, near Brinton, 13 miles from Pittsburgh, crossing the Pittsburgh Division of the Baltimore & Ohio and the Monongahela River on a long iron bridge. The object of the connection is to enable the company to use the 11 miles of the Pittsburgh, Virginia & Charleston from the junction to Birmingham, opposite Pittsburgh, as a connection with the Pittsburgh, Cincinnati & St. Louis, by which all freight trains can be transferred without passing through Pittsburgh, much relieving the press of business on the road through that city.

**Peoria, Pekin & Jacksonville.**—The Receiver is now paying off the back wages due the employees of the road at the time of his appointment.

**Philadelphia & Atlantic City.**—The employees of this road have arranged to take united action to secure the back wages due them. Their counsel has made application to the Chancellor of New Jersey, also, for an order to displace Mr. Colwell, the present Receiver, and the Chancellor has granted the usual order to show cause. The complaint against Mr. Colwell charges that he cannot legally be Receiver, being a large stockholder and therefore not a disinterested party, and further that his management of the road as President shows that he is not a competent railroad officer. Testimony is now being taken before a master.

**Pittsburgh & Castle Shannon.**—At the adjourned meeting of stockholders in Pittsburgh, Aug. 15, the committee appointed at the previous meeting reported that the interests of the company had suffered greatly from want of harmony in the management. In order to promote harmony President Hays had offered his resignation. The meeting voted to accept it and to withdraw the charges before made against him. A resolution was also adopted requiring the directors to make and publish a full report of the earnings and expenses of the company for the half-year ending June 30, the statement to include the operations of the coal mines as well as the railroad.

**Pittsburgh, Cincinnati & St. Louis.**—This company reports as follows for the seven months ending July 31:

Gross earnings.....	\$1,734,936
Expenses (66.87 per cent.).....	1,160,132
Net earnings.....	\$574,804
Interest on bonds, seven months.....	300,710

Surplus.....\$184,064

Gross earnings include interest received on equipment hired; expenses include interest on car-trust cars and rent of Monongahela Extension.

**Portsmouth, Great Falls & Conway.**—At the adjourned stockholders' meeting, Aug. 14, the directors reported that the New Hampshire Legislature had passed an act authorizing the company to mortgage its road. No communication had been received from the committee representing the creditors. A member of that committee, who was present, stated that there had not been sufficient time to call the creditors together or to arrange any plan of settlement, but that action would be taken at once. The meeting then adjourned to Aug. 28, without taking any action.

**Profile & Franconia Notch.**—This company has been organized under a charter from the State of New Hampshire to build a railroad from the Boston, Concord & Montreal through the Franconia Notch to the Profile House in the White Mountains.

**St. Louis & Creve Coeur Lake.**—This company has filed articles of incorporation in Missouri, for the purpose of building a suburban line from a point on the St. Louis, Kansas City & Northern near St. Louis, west to Creve Coeur Lake, some 15 miles. The capital stock is \$100,000, and the incorporators are Wm. T. Harris, Jno. Cromie, W. C. Hite, J. N. Kinney and H. H. Stephens.

**St. Paul & Pacific.**—An Ottawa (Ont.) dispatch of Aug. 17 says: "It has leaked out that the Government has signed a lease of the Pembina Branch of the Canadian Pacific Railway, giving the St. Paul & Pacific Railroad the exclusive monopoly of that branch for ten years, the Government retaining the privilege of terminating the lease at the end of five years by paying the St. Paul & Pacific an amount to be decided by arbitration. A bill to sanction such an arrangement was thrown out by the Senate at the last session, and the Government has assumed the entire responsibility for such a step. The fact that D. A. Smith, M. P. for Selkirk, Manitoba, a wealthy supporter of the Government, is one of the principal stockholders in the St. Paul & Pacific, causes the transaction to be looked upon here with suspicion."

**Salisbury.**—This road is now completed from the Pittsburgh Division of the Baltimore & Ohio at Meyersdale, Pa., south by west to Salisbury, 5½ miles. Three miles of this track have been laid for some time. The road will furnish transportation for the bituminous coal of the Elkridge basin, from which considerable shipments are already made.

**Springfield, St. Paris & Sidney.**—The survey of this projected road has been completed from Springfield, O., northward to Sidney. The distance is 33 miles, and it is estimated that the road can be built for \$5,000 per mile.

**Standard Oil Co.**—The Pittsburgh *Telegraph* of Aug. 14 says: "The complainant in the case of H. L. Taylor & Co. vs. Rockefeller & Flagler, in the U. S. Circuit Court, discontinued the suit to-day with the consent of the respondents, and in the case of Rockefeller & Flagler vs. H. L. Taylor & Co., proceedings were also discontinued. The discontinuing of these two cases is the result of the compromise, and the Court made an order directing the clerk to pay to the complainants the money now in the registry of the Court, paid in by the Receiver in the case of H. L. Taylor & Co. vs. the Standard Oil Company, which order was complied with."

An Oil City (Pa.) dispatch of the same date says: "The troubles and litigation between H. L. Taylor & Co. and Rockefeller & Flagler and the Standard Oil Company have been fully adjusted and the great oil suit amicably settled."



All the producing interests of the Standard have been conveyed to H. L. Taylor & Co. The suits between Taylor & Co. and J. J. Vandergriff have also been settled and are to be withdrawn. The terms of the compromise are unknown. The settlement was brought about through the instrumentality of John Pitcairn, who returned from England for that purpose.

**Troy & Greenfield.**—Proposals will be received at the office of J. Prescott, Manager, at North Adams, Mass., until Sept. 1, for the building of the Union passenger depot at that place. Bids will be received for the whole or parts of the work. Plans and specifications can be seen at the Manager's office, or at the office of Hartwell & Tilden, architects, No. 47 Devonshire street, Boston.

**Waynesburg & Washington.**—This road has been extended through Washington, Pa., to a connection with the Wheeling, Pittsburgh & Baltimore Division of the Baltimore & Ohio. The connecting track and trestle work are completed, and freight can now be transferred directly from the cars, avoiding the haul of about a mile in wagons, which has been necessary heretofore.

## ANNUAL REPORTS.

### Nashville, Chattanooga & St. Louis.

This company now owns and operates the following lines: Miles.  
Chattanooga Division, Nashville, Tenn., to Chattanooga... 151.0  
St. Louis Division, Nashville to Hickman, Ky... 170.0  
Total main line... 321.0  
Shelbyville Branch, Wartrace, Tenn., to Shelbyville... 8.0  
Jasper Branch, Bridgeport, Ala., to Victoria, Tenn... 19.5  
Tennessee & Pacific Branch, Nashville to Lebanon... 30.0  
McMinnville & Manchester Branch, Tullahoma, Tenn., to McMinnville... 35.0  
Winchester & Alabama Branch, Decherd, Tenn., to Fayetteville... 40.0  
Total... 453.5

There are in all 45 miles of sidings on the road. The three last-named branches were bought a little over a year ago, and their operations appear for the first time in this year's report. The report is for the year ending June 30, 1878.

The equipment consists of 86 engines, of which 9 are reported unserviceable; 28 passenger, 14 baggage and 2 mail cars; 713 box, 51 stock and 261 flat cars; 1 pay and 2 wrecking cars.

The general account (condensed) is as follows:

Capital stock	\$6,848,800.95
Less amount held by company	273,004.32
Stock outstanding (\$14.499 per mile)	\$6,575,796.63
Bonded debt (\$16.587 per mile)	7,522,000.00
Profit and loss	89,938.89
Other liabilities, including July coupons	770,719.38
Interest accrued during the war, fundable in Tennessee bonds	148,220.00
Total (\$33,310 per mile)	\$15,106,173.90
Road and outfit (\$31,086 per mile)	\$14,097,295.63
Assets not available, stocks, real estate, supplies, etc.	190,053.88
Assets available, company's stocks and bonds on hand, cash, receivables, etc.	809,824.39
	15,106,173.90

A separate statement gives the floating liabilities at \$463,057.02, and the assets readily convertible at \$392,463.73; the latter include \$284,000 bonds unsold. The bonded debt consists of \$1,000,000 4 per cent. bonds held by United States Government; \$1,100,000 Nashville & Chattanooga 6 per cent. bonds; \$4,700,000 7 per cent. bonds of consolidated company; \$330,000 6 per cent. bonds issued for purchase of McMinnville & Manchester and Winchester & Alabama roads; \$300,000 6 per cent. bonds secured on Tennessee & Pacific road; \$500,000 Jasper Branch Extension bonds; and \$12,000 old Nashville & Chattanooga unendorsed bonds. Of the \$300,000 Tennessee & Pacific bonds, \$280,000 are unsold.

The earnings of the entire road, 453.5 miles in 1878, and 341 miles in 1877, were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Freight	\$1,287,322.81	\$1,133,208.14	I. \$154,114.67	13.6
Passenger	516,383.56	435,066.83	I. 80,716.73	18.5
Mails	42,843.73	38,608.92	I. 4,234.81	11.0
Rents and privileges	25,258.60	24,792.63	I. 465.97	1.9
Total	\$1,871,808.70	\$1,632,276.52	I. \$239,532.18	14.7
Expenses	1,070,270.14	926,234.24	I. 144,035.90	15.6
Net earn.	\$801,538.56	\$706,042.28	I. \$95,496.28	13.5
Gross earn. per mile	4,127.47	4,786.86	D. 659.39	13.8
Net earn. per mile	1,767.45	2,070.51	D. 303.06	14.6
P. c. of exps.	57.18	56.62	I. 0.56	1.0

The earnings and expenses, with all charges, interest, dividends, rentals, improvements, etc., were divided as follows, the Shelbyville and Jasper branches being included with the main line.

	Main Line.	Tenn. & Pac.	McM. & M. Win. & Ala.
Gross earn.	\$1,700,190.25	\$55,267.68	\$22,957.09
Expenses	1,013,619.63	24,144.91	14,371.56
Net earn.	\$746,570.62	\$31,122.77	\$8,585.53
Charges	705,929.11	25,217.66	4,480.00
Surplus	\$40,641.51	\$5,905.11	\$4,105.53
Gross earnings per mile	5,050.76	1,842.26	655.92
Net earn. per mile	2,142.24	1,037.42	245.30

The McMinnville & Manchester and Winchester & Alabama roads are included under one mortgage, the interest paid on which was \$9,600, which we have divided in proportion to mileage. As the interest on this mortgage only began to run in January, only one-half year is included, but the net earnings exceeded the annual charge of \$19,200. The results of the year have confirmed the opinion of the board as to the wisdom of buying these roads.

The result of the year was as follows:

Net earnings, entire line	\$801,538.56
Interest on bonded debt	\$452,400.00
floating debt	14,887.55
cost of Tenn. & Pac. R. R.	13,206.44
Cost of steel over iron rails	32,297.71
Extra ties used with steel rails	5,100.00
Iron bridge over Stone River, T. & P. R. R.	12,011.22
Iron bridges, Chattanooga Div.	18,600.81
Nashville & Northwestern bonds paid	25,000.00
Right of way	2,133.58
Taxes	23,543.22
Lavergne disaster	10,000.33
Two dividends on stock, 2 per cent.	131,505.91
	740,746.77
Surplus for the year	\$60,791.79

Of the payments from net earnings \$95,143.32 were extraordinary, and not likely to be required in future.

There were 34 miles of steel rails and 165,268 new ties laid. The work of replacing the old bridges has been continued, the new ones being of iron on the Chattanooga Division, and of a combination of iron and long-leaf yellow pine on the St. Louis Division and branch roads. Stone piers are also being built as renewals are needed. In two years more most of the bridges will have been renewed and the track of the Chattanooga Division will be entirely of steel. Several new depots have been built.

Locomotive mileage for the year was: Passenger, 506,542; freight, 897,550; working, 273,953; total, 1,678,045; average cost per mile, 16.52 cents.

The total number of passengers carried was 156,123. During the year there were forwarded from Nashville 22,982 east-bound, and 8,009 west-bound loaded cars, and received at Nashville 18,819 from the east and 10,899 from the west.

The revenue per train mile was 127c.; expenses for road repairs, 25.3c.; motive power, 19.8c.; maintenance of cars, 8.2c.; transportation, 18c.; miscellaneous, 5.4c.; making total expenditures, 76.7c.; leaving for net receipts 50.3c. per train mile.

Train mileage on the two divisions was as follows:

	Chatta. Div.	St. Louis Div.	Entire line.
Passenger	390,331	237,710	498,041
Freight	632,496	256,190	888,685
Total	892,827	493,900	1,386,736
Earnings per train mile:			
Passenger	126.9 cts.	87.8 cts.	108.2 cts.
Freight	152.7 "	99.4 "	137.3 "
Average, all trains	145.2 "	94.0 "	127.0 "

Settlement with the United States Government has been made in full for the 15 engines bought with the St. Louis Division. No adjustment has been reached on the claim for iron taken from the McMinnville & Manchester road during the war.

The cost of extending the Jasper Branch to Victoria has been settled, and the \$90,000 bonds issued to pay for it taken by the Southern States Coal, Iron & Land Company, according to agreement.

The report notes a considerable advance in the market price of the company's 7 per cent. bonds. The sale of the \$250,000 bonds secured on the Tennessee & Pacific Branch will reduce the floating debt to a very small amount. It says, in conclusion: "In view of the present disturbed condition of transportation lines, affecting the receipts of your road, it would be idle for the directors to speculate about the future. But, whatever the effect may be upon this road, it is hoped that the present low rates in force by the Trunk lines from the West on provisions and produce to New York, Baltimore and Philadelphia, and the reduced rates now charged by the steamers from those cities to Charleston, Port Royal and Savannah, will only be temporary."

### St. Paul & Duluth.

The company owns a line from St. Paul, Minn., northward to Duluth at the head of Lake Superior, 156 miles, and it leases the Stillwater & St. Paul road, from White Bear to Stillwater, 13 miles, making 169 miles worked. The main line from Duluth to Thomson Junction, 24 miles, is owned and used in common with the Northern Pacific. The road was formerly the Lake Superior & Mississippi, and the present company was organized by the bondholders who bought the property at foreclosure sale. The first annual report of the new company covers a period of eleven months ending May 31, 1878.

The company has a land grant, from which 5,210.84 acres were sold, the receipts being \$18,963.38 in preferred stock, \$1,360.81 in cash and \$3,565.02 in notes for future payment.

The property is represented by stock alone, as follows:

Preferred stock and scrip (\$34.254 per mile)	\$5,343,616.64
Common (\$22.365 per mile)	3,488,905.96
Total (\$56,619 per mile)	\$8,832,522.60

The account of preferred stock is as follows:

Issued to holders of L. S. & M. first-mortgage bonds	\$5,227,128.33
to United States Court for bonds not yet presented	124,800.00
to holder of St. Paul coupons	54,155.32
to Northern Pacific R. R. Co.	144,006.37
Total	\$5,550,090.02

Canceled by payment of Northern Pacific Co. on account of purchase of half interest in road from Thomson Junction to Duluth \$128,000.00 || Canceled from land sales and stumpage | 78,473.38 |
|  | 206,473.38 |

Balance outstanding \$5,343,616.64 |

The earnings and expenses for the eleven months were as follows:

Freight	\$383,944.00
Passenger	90,789.24
Mails, express, etc.	18,616.56
Total (\$2,860.06 per mile)	\$483,349.80
Expenses (74.96 per cent.)	362,342.05

Net earnings (\$716.02 per mile) \$121,007.75 |

The Land Department receipts were as follows:

Land sales	\$20,324.19
Stumpage	76,635.73
Total	\$96,959.92
Paid in preferred stock	\$78,073.38
Expenses of Land Department	16,647.29
	\$94,720.67

Cash balance \$2,239.25 |

The income account was as follows:

Net earnings	\$121,007.75
Net balance from Land Department	2,239.25
Total	\$123,247.00

Rent, Stillwater & St. Paul R. R. \$18,333.33 |

Interest 6,626.06 |

Taxes, insurance and legal expenses 18,267.03 |

New construction and equipment 7,011.97 |

Northwestern Equipment Trust 40,665.46 |

Knife Falls Branch 12,311.14 |

Stock farm at Mahtowa 5,151.12 |

  | 108,360.11 |

Surplus \$14,880.89 |

The total number of passengers carried was 46,568; tons freight, 224,767, of which 118,503 tons were moved southward and 106,265 tons northward. The chief items of southward freight were 37,484 tons wood and ties, 35,578 tons lumber, 16,551 tons coal, 11,542 tons machinery, iron and castings, and 6,605 tons salt; of north-bound freight, 41,545 tons wheat, 32,291 tons flour, 5,480 tons other grain and 5,469 tons mill-feed. Except lumber, most of the freight was through.

Some improvements have been made on the road, including three new combination bridges, several long trestles filled up, steel rails laid on the heavy grades near St. Paul and between Thomson and Duluth. A wheat store-house

was built at St. Paul and wind-mills put up at several water stations. One of the high trestles near Duluth is now being rebuilt.

The Lake Superior Transit Company has established a new line of steamers, making three trips a week to Duluth during the season of navigation. Rates have been kept down by the competition of other lines, however, and this season's movement of wheat has been light, owing to the heavy shipments during the winter, when navigation was closed, and the demands of the millers for grain. The diversion of the Northern Pacific's St. Paul business by the completion of the Brainerd Branch has also diminished the business of the road. The lumber traffic was affected by the mild winter and the absence of snow, preventing the cutting and hauling of logs.

Work on the Knife Falls Branch has been resumed and will be completed this year, if possible. The stock farm at Mahtowa was started to show the value of the company's lands in that section for stock raising.

### Missouri River, Fort Scott & Gulf.

This company owns a line from Kansas City, Mo., to Baxter Springs, Kan., 161 miles. It is in possession of a receiver, pending suits for foreclosure of mortgage. Its report is for the year ending Dec. 31.

The bonded debt is \$6,947,000; unpaid coupons, Dec. 31, 1877, amounted to \$2,127,550. The bonds bear 10 per cent. interest.

The company has a considerable land grant, from which the Land Department in 1877 sold 33,858 acres of neutral lands for \$228,176, being an average of \$6.75 per acre. The cash receipts, on account of land, were \$138,810, which was \$70,175 less than the previous year. There remains unsold of the neutral land, 308,782.30 acres. This land is offered on long credit, payments running through 10 years, with interest at the rate of 7 per cent. per annum, and a discount of 20 per cent. is made on payment in full at time of purchase.

The traffic for the year was as follows,

	1877.	1876.	Inc. or Dec.	P. c.
Train mileage	517,672	614,599	D. 96,927	15.8
Passenger mileage	4,977,070	4,589,110	L. 388,560	8.5
Tonnage mileage	28,134,154	30,567,648	D. 2,433,494	8.0

The earnings of the road for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Passengers	\$225,362	\$207,822	I. \$17,540	8.4
Freight	581,491	623,406	D. 41,915	6.7
Express and mail	37,533	31,226	I. 1,307	4.2
Miscellaneous	20,348	30,640	D. 13,292	33.6
Total	\$865,734	\$902,094	D. \$36,360	4.0

Expenses and taxes 490,498 | 529,980 | D. 33,482 | 6.3 |

Net earnings \$396,236 | \$372,114 | D. \$2,878 | 0.8 |

Gross earnings per mile 5,377 | 5,603 | D. 226 | 4.0 |

Net earnings per mile 2,293 | 2,311 | D. 18 | 0.8 |

Per cent. of expenses 57.33 | 58.76 | D. 1.43 | 2.4 |

From net earnings \$142,059 was paid for new construction and equipment, leaving a balance of \$227,177. The income account was as follows:

Gross receipts from road and lands	\$1,004,545
Expenses of all kinds, both departments	740,651
Balance	\$263,894
County bond coupons	34,456
Land sold for Union depot, Kansas City	14,280

Total net revenue \$312,630 |

No statement is given of the disposition of this net revenue. An increase in earnings and land sales was expected during the current year, from the growing immigration to Kansas.

### Detroit, Lansing & Northern.

This company, successor through foreclosure to the Detroit, Lansing & Lake Michigan, owns a line from Detroit, Mich., to Howard City, 190.6 miles; the Belding Branch, 1.7 miles, and the Stanton Branch, 25.2 miles, making 186.5 miles in all. Five miles of the Stanton Branch was built near the close of the year covered by the report, that ending Dec. 31, 1878.

The equipment consists of 26 engines; 15 passenger and 6 baggage cars; 744 freight and 16 service cars.

The general account is as follows:

Common stock	\$1,825,617.52
Preferred	2,503,380.00
Total stock (\$23,212 per mile)	\$4,328,997.52

Funded debt (\$15,003 per mile) 2,788,000.00 |

Accounts and balances 181,127.89 |

Balance of income account 47,995.33 |

Total (\$39,443 per mile) \$7,356,120.74 |

Road and equipment (\$38,215 per mile) \$7,126,997.52 |

Cash, supplies, balances, etc. 229,123.22 |

  | 7,356,120.74 |

The preferred stock represents a part of the former bonded debt.

The work for the year was as follows:

	1877.	1876.	Increase.	P. c.
Train mileage	704,749	580,173	144,576	25.8
Passenger mileage	7,047,892	6,625,507	422,385	6.4
Tonnage mileage	24,903,498	21,534,631	3,368,867	15.9

The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Passengers	\$205,242.45	\$198,138.35	I. \$7,104.10	3.6
Freight	537,502.08	511,903.17	I. 25,598.91	5.0
Express, mail, etc.	45,816.33	32,956.40	I. 12,859.93	38.9
Total	\$788,560.86	\$743,087.92	I. \$45,472.94	6.1

Expenses 505,614.55 | 531,754.85 | D. 26,140.30 | 4.9 |

Net earnings \$282,946.31 | \$211,333.07 | I. \$71,613.24 | 33.9 |

Gross earn. p. m. 4,344.69 | 4,094.15 | I. 250.54 | 6.1 |

Net " " 1,558.93 | 1,164.38 | I. 394.55 | 33.9 |

Per cent. of exp. 64.12 | 71.56 | D. 7.44 | 10.4 |

Included in expenses for 1877 were \$43,178 for steel rails, new iron bridge, new equipment and other permanent improvements. Payments from net earnings were:

Net earnings \$282,946.31 |

Interest on bonded debt \$204,370 |